STEEL

PRODUCTION

PROCESSING

DISTRIBUTION

USE

EDITORIAL STAFF

E. L. SHANER
Editor

E. C. BARRINGER
Managing Editor

ASSOCIATE EDITORS

A. J. HAIN
G. H. MANLOVE
E. F. ROSS
J. D. KNOX
A. H. ALLEN

New York
E. C. KREUTZBERG
B. K. PRICE
L. E. BROWNE

Pittsburgh
E. A. FRANCE JR.

Chicago
W. G. GUDE

Washington
L. M. LAMM

London
VINCENT DELPORT

BUSINESS STAFF

GEORGE O. HAYS
Business Manager

New York
E. C. KREUTZBERG
E. W. KREUTZBERG

Pittsburgh
S. H. JASPER

Chicago
L. C. PELOTT

Cleveland
JOHN HENRY
R. C. JAENKE

R. T. MASON
Circulation Manager

COMING!

The "New Deal" in business as affected by the "New Deal" in government — Washington news interpreted in the Mirrors of Motordom manner—each week

Highlights of the meeting of the American Iron and Steel Institute; a resume of the addresses of Schwab, Sisson, Kettering, Lamont and others—next week

Liberal abstracts of the institute technical papers—rolled steel in machine construction, aging of mild steel sheets, insulation of open-hearth furnaces—next week

More authoritative data on inventories—soon

CONTENTS

May 22, 1933

THE WEEK IN PERSPECTIVE	9
The Voice of Industry	10
Steel To Aid Roosevelt Plan; Unionization Vexes	11
Condensed Version of Industrial Partnership Bill	12
Business News from Washington	13
Steel on Verge of Profit, with 40 Per Cent Rate	15
Mirrors of Motordom	16
Personals	17
Obituary	18
Speakers and Subjects for Steel Institute Program	19
EDITORIAL—Can Industry Draft Code Promptly?	20
THE BUSINESS TREND	21
Develops Alloy Steels for Heavy-Duty Forgings	23
Widened Bascule Bridge Has Steel Mesh Decking	26
British Iron and Steel Institute Meeting	28
A. S. T. M. Announces Program for Convention	28
Improving Open-Hearth Design—Part V, Continued	32
Making the Most of Methods and Materials	35
Progress in Steelmaking	36
Scanning the Field of Technology	38
New Equipment	39
MARKET REPORTS AND PRICES	41-59
HERE AND THERE IN INDUSTRY	59
CONSTRUCTION AND ENTERPRISE	61
ADVERTISERS' INDEX	66

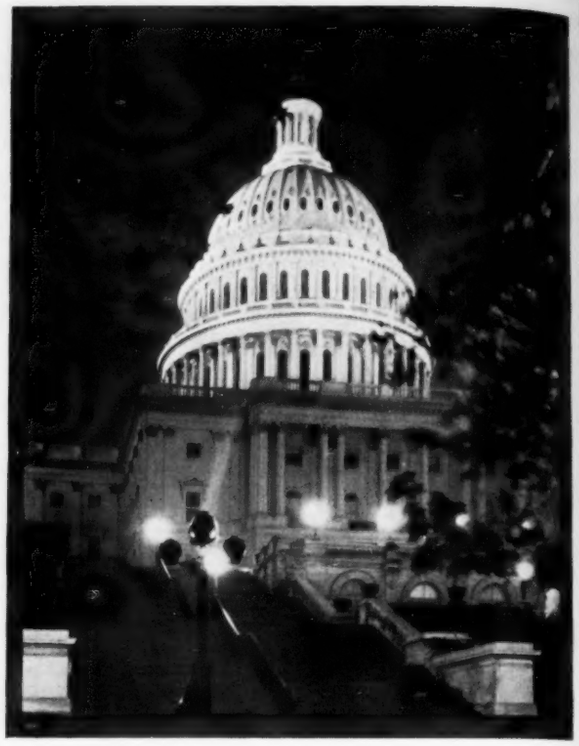
STEEL is published every Monday by PENTON PUBLISHING CO., Penton Building, Cleveland, O. JOHN A. PENTON, *Chairman of the Board;* C. J. STARK, *President;* J. D. PEASE, *Vice President;* F. V. COLE, *Secretary.*

Member Associated Business Papers Inc. and National Publishers Association. Branch Offices: New York, 220 Broadway; Chicago, Peoples Gas building; Pittsburgh, Oliver building; San Francisco, Claus Spreckels building, 703 Market street; Washington, National Press building; Cincinnati, Schmidt building; London, Caxton House, Westminster, S. W. 1; Berlin, Lichterfeld-West, Dahlmerstrasse, 64a, Germany. Subscription in the United States, Cuba and Mexico, one year $4, two years $6; in Canada one year $6.60, two years $11.20; in Great Britain and European countries, one year £2; two years £3.

Entered as second class matter at postoffice at Cleveland under the Act of March 3, 1879.

Copyright 1933 by the Penton Publishing Co.

Government in Business



WHETHER or not we like it, we are on the road to a controlled economy. The forces of government and industry are to be united in a massed drive to restore business to profitable levels.

The weapons will be similar to those employed successfully in the stirring war days of 1918. Legislative red tape will be cut. Regulatory boards will enforce co-operation.

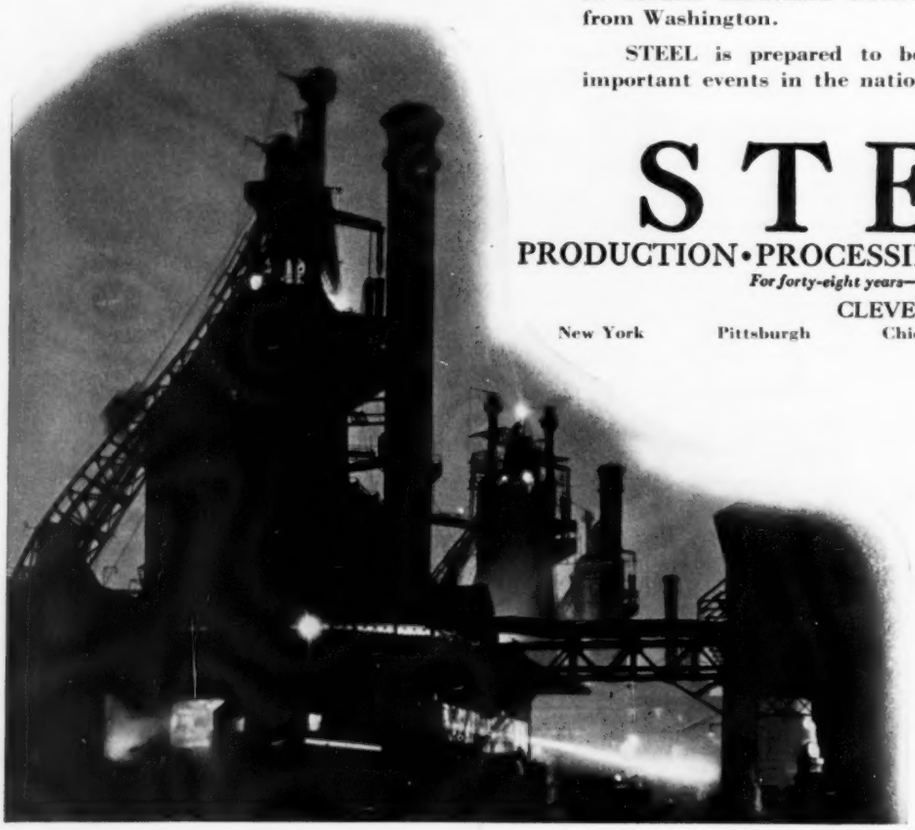
This regimentation of industry will change the rules of business. Daily, new regulations will be announced and old ones modified. Rulings of the utmost importance to producers, manufacturers, fabricators and distributors will be issued frequently.

You and your company will be guided and governed by these regulations. You will want full information regarding them promptly. You will want interpretation of their significance.

Recognizing this new need, STEEL is expanding its Washington service for your benefit. Already we are presenting every week a behind-the-scenes resume of the government's activities relating to industry. It is interpretation of the functioning of the administration and congress—and in the manner of "Mirrors of Motordom".

As government and industry move into the new partnership, STEEL will be geared to give its readers unexcelled service on pertinent information from Washington.

STEEL is prepared to be your trained observer of important events in the nation's Capitol.



STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

CLEVELAND

New York Pittsburgh Chicago Washington London

Issued Weekly—
on *Monday*

Volume 92 Number 21

STEEL

For forty-eight Years—IRON TRADE REVIEW

PRODUCTION • PROCESSING • DISTRIBUTION • USE

The Week in Perspective

LET the government bring on industrial control—steel production has touched 40 per cent, for the first time in two years, and this week is making a flying start toward 50. A rise of three to four points now appears to be the weekly stint of the industry (p. 15); in five weeks it has doubled its activity. Finishing mills not only have absorbed all current output but also have cut down stocks of semi-finished steel. Tin plate mills are up to 80 per cent.

Volume Is Changing Red to Black

In point of profits, steel also is entering the promised land. At 50 to 55 per cent, on the way down, it passed from black to red ink, but so sweeping economies have been effected that 35 to 40 per cent has been regarded as the twilight zone for red to black on the way up. For the average mill, current operations offer an even break. And from prices as well as volume comes aid, as pig iron, sheet, strip, reinforcing bar and highway mesh quotations (p. 41) are being put up.

Other Users Catching Up With Autos

Automotive requirements continue dominant, and indications point to sustained assemblies at Detroit this summer rather than a seasonal decline (p. 16). Each week the automotive picture grows brighter. But miscellaneous demand is broadening (p. 41), more rail mills are starting (p. 46), only the building industry is failing to make some contribution to mill order books (p. 48). More anticipatory buying is appearing.

Collective Bargaining Nightmare Reappearing

So far as iron and steel is concerned, the only cloud on the horizon is the industrial control bill, now before congress and slated for passage before June 10. Including trade practice codes, the industry is disposed to co-operate (p. 11), but the provision for collective bargaining opens a bad chapter for steel and other unorganized industries. . . . Labor is the common denominator of the Roosevelt administration (p. 13); he is not unaware that labor and not industry buttered his bread. . . . But the cue for iron and steel, like other industry, is to co-operate (p. 20); this seems to be the opportunity for the American Iron and Steel institute to be fully representative. . . . On the Continent a fuller measure of co-operation within the iron and steel industry is approaching (p. 57). Several steel comptoirs, to function for five years, will become operative June 1. Great Britain continues to report gradual improvement, with export business, while unremunerative, expanding in volume.

Self-Determination Is Policy, Too, in Standards

The trend toward self-regulation of industry is evident also in the inclusion (p. 30) of

The school boy of today finds it difficult to carve his initials on modern steel desks, such as that shown above in process of manufacture by means of the oxyacetylene blowpipe

31 new national standards in the recently-issued yearbook of the American Standards association. . . . Soviet Russia is now pursuing the same policy as the United States, shifting (p. 25) the responsibility for setting up standards from a central organization to the interested industries. This also places more emphasis on fundamental research.

Alloys Stand Up in Die Blocks, Piston Rings

Used in die blocks, one type of nickel-chromium-molybdenum steel shows minimum distortion in heat treatment and hardens to great depths (p. 23). On account of inherent toughness and balanced hardening characteristics, die breakage in heat treatment and operation has been practically eliminated. These die blocks range in size from 6-inch to 20 x 45-inch sections, weighing from 100 to 14,000 pounds. . . . A base mixture of 1.50 per cent nickel and 0.45 per cent chromium for piston rings has been found (p. 35) by an eastern oil refinery to give a life of 13 months, compared with 6 weeks for conventional gray iron. In addition, leakage was 1300 gallons less.

Zero Zone in Open Hearths Is Over the Bath

Since most open-hearth steel furnaces are operated with pressure at the incoming end and suction at the outgoing end, there must be a region of zero pressure (p. 32). For proper balance, this region should be over the bath. . . . More open-hearth furnaces will be added to a steelworks in the Detroit area (p. 53), in direct response to increasing automotive requirements. . . . Sound steel with some inclusions is preferable to unsound steel with none, is the opinion of the eminent Sir Robert Hadfield expressed (p. 28) at the British Iron and Steel institute annual meeting. . . . At this meeting the bessemer medal was received (p. 17) by Dr. W. H. Hatfield. . . . The American Iron and Steel institute meets (p. 19) May 25.

Riveted Steel Mesh Wins Over Wood Block

When a sevenfold increase in traffic made widening of a bascule bridge in Seattle imperative, engineers were confronted with the further difficulty of increased weight making it impossible to operate the bridge with existing counterweights and machinery. But when the wood block flooring weighing 40 pounds per square foot was ousted in favor of riveted steel mesh decking (p. 26) weighing 22½ pounds, laid over 6-inch channel supports, the problem was solved. . . . In a novel way (p. 36) a steelworks mixer has been counterweighted, a 25-horsepower motor hoisting the weight through planetary gears. . . . An unusual type of base for electric motors absorbs (p. 35) all possible modes of vibration.

The VOICE of INDUSTRY

Communications appearing here do not necessarily reflect the opinion of STEEL *or of its editors.*

We Are in "New Deal" and Seem To Like It

The following is an excerpt from a message to stockholders of the American Rolling Mill Co. from its chairman, George M. Verity:

To Stockholders:

. . . The real strength of a nation does not lie in its national administrators or in its governmental agencies; it does not lie in its material resources; it does not lie in the hands of the comparatively few who gain the limelight of publicity because of the commanding positions which they attain in various walks of life; when all of such groups are summed up together they only represent a mere fraction of the human power of the nation.

Our real national strength lies in the great unheralded armies of men and women who are the backbone of the communities, large and small, in which they live, work and serve. They are men and women of character and of integrity of purpose, who represent the best of human life. A great majority of them may be nationally unknown, but their name is legion, and their lives run like the deep waters of a mighty river, unseen, unruffled, unchecked, but flowing on irresistibly to a definite goal, until life is finished and they reach the great seas of the life beyond.

Herein lies the inexhaustible strength of America which cannot be measured by any political or material yardstick.

During the past two and a half months we have witnessed a marvelous and unparalleled transformation of the nation. Former plans, policies and beliefs have been cast to the winds and we have accepted an entirely new philosophy which we will support as long as we feel it is sound. We have possibly gone far afield in an earnest desire to find some new way out of a bewildering wilderness of stagnation.

As yet the situation in which we find ourselves is too new to even attempt to measure or to fully understand it. We are in the midst of a new deal and we seem to like it.

If, through all this crucial travail, industry is now going to be permitted to intelligently plan its own progress under a governmental supervision, which will not be dictation or domination but which represents a new sort of helpful partnership between government and business, which will encourage and not throttle its initiative, and which will not destroy its productive power, better days are surely ahead and the seeming losses of the past can prove to be our most permanent investment.

The industrial structure of America is today the most powerful and potent instrument for constructive accomplishment ever created by man. Its efficiency, its ability to successfully meet the demands of an advancing civilization and to contribute to higher and higher standards of living, is unlimited.

America's industrial eminence and its outstanding accomplishments are not the products of chance, they represent much of gruelling endeavor, daring, vision and enterprise of a high order.

All that a properly equipped industry needs is intelligent and broadminded direction and the right to proceed in an orderly and open manner to bring harmony between production and consumption, to enable it to move out into new fields of a more fairly distributed and therefore a more enduring prosperity than we have heretofore enjoyed.

Mighty forces of government and of business are unquestionably at work to move commerce and industry in the right direction and we have great hope of and confidence in the future.

GEORGE M. VERITY, Chairman,
Middletown, O. American Rolling Mill Co.

Iron, Steel To Aid Roosevelt Plan, but Unionization Vexes

IRON and steel's first reaction after scanning the Wagner industrial control-public works bill, introduced in congress May 17, is that with minor exceptions it can go along with the Roosevelt program in all but the labor provisions.

The industry assents, in principle, to establishing trade practice codes designed to improve competition and restrain the ruthless wage and price cutter, to agreeing upon minimum wage rates and maximum hours of labor, to co-operating with the administrator of the bill in accelerating recovery.

But making such trade practice codes contingent upon collective bargaining and including a prohibition against what labor terms a "yellow dog" contract opens up a dangerous issue that has lain dormant since the abortive strike of 1919, iron and steel believes.

So far as working conditions and wage rates are concerned, iron and steel executives are reported as confident that they can make a showing comparable with the organized industries. Where employes have shown a disposition to organize, company unions have been fostered.

In many respects, the industrial control bill is permissive, and it is conceivable that if the industry should continue through the summer to display the virility it has in April and May, the objectives of the President would be accomplished without resort to control or partnership, as the formula is variously described.

Loophole for Unions

However, the very pointed references in the proposed measure to the situation of labor give labor leaders an opening which, if pursued, would compel iron and steel executives to stand by while their industry is organized.

Specifically, the Wagner bill states that every code of fair competition, agreement and license shall contain these conditions: "(1) That employes shall have the right to organize and bargain collectively through representatives of their own choosing, (2) that no employe and no one seeking employment shall be required as a condition of employment to join any organization or to refrain from joining a labor organization of his own choosing."

While the second stipulation operates two ways and prohibits coercion into a union, it also is a powerful weapon for labor. The enforcement of this labor section, like other provisions of the bill, will depend in large measure upon the attitude of the administrator named by the President—understood to be Gen. Hugh S. Johnson, of Moline, Ill.—but iron and steel executives see a wedge in the door.

For all practical purposes, the only union now operating in the iron and steel industry is the Amalgamated Association of Iron, Steel and Tin Workers, of which Michael F. Tighe, Pittsburgh, is president. The Amalgamated scale governs some sheet, tin plate and bar iron mills.

Under the heading, "The 30-Hour-Week Advances," the official organ of the Amalgamated association states in its May 18 issue:

Inexorably the 30-hour work-week advances. Today we are nearer its realization than a week ago, whether the portents seem that way or not.

Necessity knows no tradition and mighty little law.

Humanity, fighting for bread, will find its way.

Employers who have long fought progress will be swept aside if they do not voluntarily accept change.

Political leaders do not seem to clearly know where they are going. Rival "brain trusts" seem to cross wires.

But a clear direction will emerge. The 30-hour week is coming.

Organized labor has led the way and though the nation has been and is slow in following, the arrival is certain.

The 30-hour week is coming!

Incidentally, both the Black and Connery 30-hour work week bills are considered dead at this session of congress, but the same end can be attained by agreements within industries.

Fortunately for iron and steel executives, the Wagner bill is a live issue just prior to the annual spring meeting of the American Iron and Steel institute in New York, May 25. The opening address of R. P. Lamont, president, in the morning is expected to disclose the program of the institute in meeting this and other current problems, and the relation of the industry to the political situation will be discussed at the banquet in the evening.

Trade Codes Are the Key

Substantially as related last week, the Wagner bill provides for the collective action of various industries, through their trade associations, to the end that employment be increased, harmful practices be eliminated and healthy competition be restored. This action is to take the form of trade practice codes which, after their acceptance by the President through his administrator, will become the law of the industry. A summary of the bill appears on the following page.

The message of the President, accompanying the bill to congress, bespeaks action prior to adjournment, probably June 10, and it is believed that congress will act. There is some congressional objection to relaxation of antitrust laws, but it is not serious.

Accompanying industrial control is a public works program designed to expend $3,300,000,000 as rapidly as possible, with highways the chief beneficiary. A decision on how to raise the $220,000,000 required annually to meet the service on and amortize the bond issue required will probably chiefly engage congress.

Probably the American Iron and

Moline Implement, Military Man To Lead Industry

A GRADUATE of West Point who has divided his career between the army and the farm implement industry will administer the government-industry partnership plan proposed by President Roosevelt in the Wagner bill if Gen. Hugh S. Johnson, Moline, Ill., accepts the appointment, as expected.

Born at Fort Scott, Kans., Aug. 5, 1882, General Johnson was graduated from West Point in 1903. Until Feb. 25, 1919, when he resigned, he forged steadily ahead in the military service.

In 1918, when he was brigadier general and chief of the purchase and supply bureau of the general staff, he became identified with the war industries board. Following a short period with the board he again entered active service, until his retirement in 1919.

He originated the plan for the selective draft in 1917 and conceived the organization of purchase, storage and traffic division of the general staff.

Since 1919 General Johnson has been vice president, general counsel and assistant general manager of the Moline Plow Co., and was the organizer in 1925 and has since been chairman of the board of the Moline Implement Co.

For service in the Mexican campaign and the World war he was decorated. As a writer on military subjects and also of stories and essays for magazines he has achieved no small fame.

General Johnson has been in Washington several weeks, conferring with those who wrote the bill, and is thoroughly familiar with it.

Steel institute will represent what might be termed the heavy iron and steel industry. The American Institute of Steel Construction, which will probably represent the fabricators of structural steel, notes in a bulletin: "It is well to bear in mind that in view of existing conditions it is far wiser for our industry to extend constructive co-operation to the government than to register opposition to the trend of public opinion."

In a special message to congress May 17 President Roosevelt said:

Before the special session of congress adjourns, I recommend two further steps in our national campaign to put people to work.

My first request is that (1) congress provide for the machinery necessary for a great co-operative movement throughout all industry in order to obtain wide re-employment, to shorten the working week, to pay a decent wage for the shorter week and to prevent unfair competition and disastrous overproduction.

Employers cannot do this singly or even in organized groups, because such action increases costs and thus permits cutthroat underselling by selfish competitors unwilling to join in such a public-spirited endeavor.

One of the great restrictions upon such co-operative efforts up to this time has been our antitrust laws. They were properly designed as the means to cure the great evils of monopolistic price fixing. They should certainly be retained as a permanent assurance that the old evils of unfair competition shall never return.

But the public interest will be served if, with the authority and under the guidance of government, private industries are permitted to make agreements and codes insuring fair competition. However, it is necessary, if we thus limit the operation of antitrust laws to their original purpose, to provide a rigorous licensing power in order to meet rare cases of noncooperation and abuse. Such a safeguard is indispensable.

$400,000,000 for Highways

The other proposal (2) gives the executive full power to start a large program of direct employment. A careful survey convinces me that approximately $3,300,000,000 can be invested in useful and necessary public construction, and at the same time put the largest possible number of people to work.

Provision should be made to permit states, counties and municipalities to undertake useful public works, subject, however, to the most effective possible means of eliminating favoritism and wasteful expenditures on unwarranted and uneconomic projects.

We must, by prompt and vigorous action, override unnecessary obstructions which in the past have delayed the starting of public works programs. This can be accomplished by simple and direct procedure.

The only public work specifically mentioned in the bill is a maximum of $400,000,000 for roads.

Inland Steel Co. To Build Tin Plate Mill

Directors of Inland Steel Co., Chicago, are planning an expenditure of $3,000,000 for construction of a tin mill at Indiana Harbor, Ind., with an annual production of 5,000,000 base boxes. This will mark entrance of this company into the manufacture of tin plate, thus making three producers in the Chicago district.

Inland Steel Co. last year completed a new continuous plate and strip mill designed to roll continuous strip in widths from 24 to 66 inches, depending upon commercial requirements and gage. This unit likely will be employed for furnishing breakdowns to the new tin plate plant. The company also will make deep drawing tin plate.

An order recently was placed for a 42-inch Steckel cold mill for installation in its strip department. Plans also are being considered for converting a 72-inch cold mill to a nondriven mill, with motor-driven reels on either side, for wide strip.

Re-elect Directors

The nine directors of the American Iron and Steel institute whose terms expire in 1933 were re-elected recently, following a mail ballot.

Condensed Version of Government-Industry Partnership Bill

SECTION 1. A national emergency exists. It is the policy of congress to remove obstructions to the free flow of interstate commerce, promote organization of industry for co-operative action among trade groups, induce and maintain united action of labor and management under adequate governmental supervision, eliminate unfair competitive practices, reduce and relieve unemployment, improve standards of labor.

Section 2. (a) To accomplish this the President is authorized to establish agencies and utilize voluntary services without regard to civil service.

(b) The President may delegate his authority and establish an industrial planning and research agency.

(c) This program shall cease in two years, or sooner, if the President proclaims the emergency ended.

Section 3. (a) Upon application to the President by industrial associations or groups the President may approve codes of fair competition if the President finds (1) such associations or groups impose no inequitable restrictions on admission to membership and are truly representative and (2) such codes are not designed to promote monopolies and oppress small enterprises. The President may require such reports and keeping of accounts as may seem desirable for the protection of consumers, competitors and employes.

(b) If the President has approved such codes they shall be standards of fair competition and any violation will be an unfair method of competition within the meaning of the federal trade commission act, each violation being punishable by a fine of not more than $500.

(c) United States district courts will have jurisdiction over violations and district attorneys will institute proceedings in equity to prevent and restrain such violations.

(d) Upon his own motion or if complaint is made to the President that there are abuses inimical to the public interest in any industry and if no code has been adopted by such industry, the President himself may prescribe a code.

Section 4. (a) The President is authorized to approve voluntary agreements tending to effectuate the purpose of the bill.

(b) Whenever the President finds it essential to license business enterprises to make effective a code, no person without a license shall engage in interstate commerce, the penalty being a fine of not more than $500 or imprisonment of not more than six months, or both. Each day of violation constitutes a separate offense.

Section 5. During the life of the bill and for 60 days thereafter any action complying with any code, agreement or license shall be exempt from provisions of antitrust laws.

Section 6. (a) No association or group shall be eligible to the benefits of the bill unless it files with the President such information concerning its activities as shall be ordered by the President.

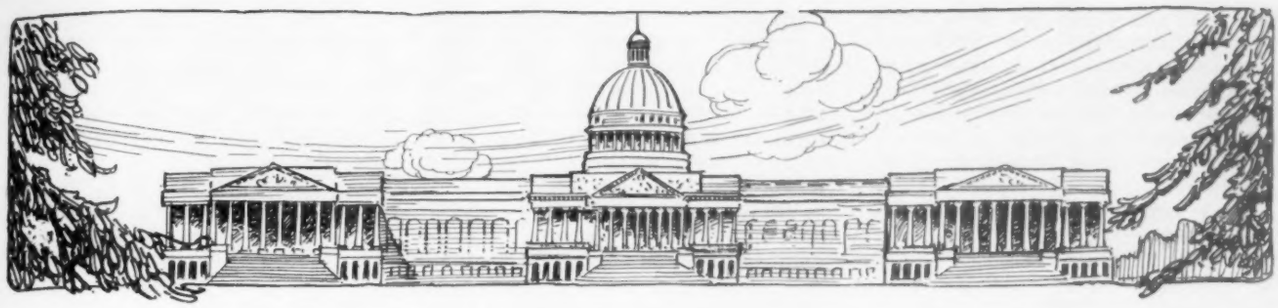
(b) The President is authorized to prescribe rules insuring that any organization shall be representative of its industry.

(c) The federal trade commission shall make investigations necessary to enable the President to carry out the provisions of the bill.

Section 7. (a) Every code or license shall be conditioned (1) that employes have the right to organize and bargain collectively through representatives of their own choosing; (2) No employe or applicant shall be required to sign an agreement to refrain from organizing; (3) employers shall comply with maximum hours of labor, minimum rates of pay and other working conditions prescribed by the President.

(b) The President so far as practicable shall afford every opportunity to employers and employes to establish by mutual agreement the standards as to maximum hours of labor, minimum rates of pay and other working conditions, and these standards shall have the same effect as a code of fair competition.

(c) Where no such mutual agreement has been approved by the President he may investigate and prescribe such conditions. The President may differentiate according to experience and skill of employes and according to the locality of employment, but no attempt shall be made to introduce any classification which might tend to set a maximum as well as a minimum wage.



WASHINGTON

Labor Common Denominator

◆ ◆ ◆

Gen. Johnson, Administrator

◆ ◆ ◆

Freight Rate Hearing Farce

FOR a ready understanding of President Roosevelt's thinking and policies, relate every development to labor or what is popularly termed "the little fellow."

It was labor—reckoning agriculture as labor—that put the President in the White House and it is labor, he believes, that will keep him there and the Democratic party in the saddle.

To industry, the President owes little. Himself wealthy and mindful of its place in the national economy, he will not purposely antagonize it. Shrewd politician, he is aware that the return of prosperity will be the gage of his success. But superficially, any advantages that accrue to industry will appear to be crumbs from labor's table.

The inside ring of advisers around the President contains no one who might be called a spokesman for industry, but many who think in terms which industry considers radical.

In matters affecting industry Secretary of Labor Perkins, whose chief contacts have been with the lighter, highly-organized trades of New York state, sits in oftener than Secretary of the Treasury Woodin, the only "big business" man in the cabinet.

Aid for "The Little Fellow"

In drafting the agricultural relief act, which includes permissive powers for inflation, the objective was to lift agricultural and commodity prices to enable the farmer and the debtor class—usually "the little fellow"—to meet their obligations.

In framing the industrial recovery-public works bill, introduced in the senate Wednesday, Secretary Perkins and Donald Richberg, counsel for railroad unions, sat on the committee, but no representative of industry.

The preamble of the bill starts, "A national emergency productive of widespread unemployment * * * is hereby declared to exist." A statement by Senator Wagner, sponsor of the bill, states: "The principal and immediate object of this bill is to open opportunities for the employment of several million men and women and thus distribute purchasing power which will be effective in starting again the wheels of industry." Marked solicitude, again, for labor.

In supporting the administration's railroad bill before a house committee, J. B. Eastman, member of the interstate commerce commission and reported intended co-ordinator of the railroads, courageously declared that the railroads must reduce their labor forces, but vitiated his stand by proposing that labor thus released be employed in the elimination of grade crossings and other quasi-public projects—at the public's expense.

Nowhere in the agricultural relief, industrial control or railroad measures is the stockholder or executive mentioned. For political purposes, they do not exist. As labor's lot is improved and its purchasing power returns, industry presumably will benefit, but this condition will have the appearance of a by-product.

Complete unionization of the United States is possible if the full scope of the industrial control bill is realized. Organized labor achieves a sweeping victory in the inclusion of a prohibition of the so-called "yellow dog" contract.

If the American Federation of Labor chooses, it can put organizers into the steel industry or any other unorganized industry and insist upon a voice in fixing maximum hours of labor and minimum rates of pay, and if an industry objects the President can step in and do it himself.

Thus, while the industrial control bill is referred to by the administration as a partnership of industry and government and the antitrust laws are waived, labor is the base of the pyramid. Apparently the cue for manufacturers is to fix satisfactory wage rates, make a showing of costs and agree at a price that without too much ostentation will take care of the stockholder.

The President's advisers by no means are turning a deaf ear to big business. Representatives of practically all industries are making contacts in Washington and extending offers of co-operation. Secure in their leadership, these advisers lend an ear, but have preconceived ideas.

It cannot be overlooked that the industrial control bill is permissive. Like the agricultural relief-inflation act it has a more generous sprinkling of "mays" than "shalls."

The objective of the President is to increase employment and raise commodity prices. If the threat of invoking his powers accomplishes this, alright. He has not used his powers for inflation.

However, it is believed that most industries will welcome the opportunity afforded by the industrial control bill to get together, set up standards of competition, hobble the price cutter and distribute production evenly.

And labor, presented with a lifetime opportunity to bore in, is expected to prod into action those industries tending to remain aloof.

Soldier in Command

The President, of course, will delegate his powers under the industrial recovery bill. The control board so widely discussed prior to the introduction of the bill and on which were to be the secretaries of commerce, labor, agriculture and interior and a civilian chairman is not mentioned in the draft, but provision has been made for the appointment of administrative officials and an industrial planning and research agency.

Formal tender of what in effect will be the administratorship of the bill has been made by the President to Gen. Hugh S. Johnson, formerly associated with Bernard Baruch on the war industries board and his economic adviser recently. General Johnson is expected to accept. In the formative stages of the bill General Johnson was reported an advocate of the government writing the rules for industry's regulation and to favor more strict regulation than the bill now specifies.

General Johnson apparently will be one of a triumvirate representing the President in promoting recovery. George N. Peek, also a farm implement manufacturer of Moline,

Ill., will administer the farm relief act; Mr. Eastman, on the commerce commission since 1919, is expected to co-ordinate transportation, while General Johnson will govern industry. All are young men, General Johnson being 51, Mr. Peek 59 and Mr. Eastman 51.

As a result of industrial control, the federal trade commission may take on a new lease of life. Slated to be dropped as an economy measure, Wilson Democrats, rallied by Huston Thompson, a former chairman, urged it as the vehicle for enforcing the proposed securities bill and saved it. Since violations of trade codes will be punishable under the trade commission act, the commission also fits into this picture.

Freight Rates to Stand

Interstate commerce commissioners have been putting on a show at which even they have been bored.

Last week they concluded taking testimony from shippers advocating a reduction in railroad freight rates. So slight is the chance of any favorable decision—let alone any decision at all—that the American Iron and Steel institute withdrew its appearance and only representatives of the scrap, cast iron pipe and tin plate detinning industries took the stand for iron and steel.

The contention of shippers in originating the inquiry was that freight rates were out of line with commodity prices. The viewpoint in Washington is that if rates are cut the United States will be compelled to dig deeper into the treasury for the support of the carriers, and that if commodity prices do not rise of their own accord inflationary measures will accomplish this and bring them into line with railroad rates. Hence the futility of any action now.

Benjamin Schwartz, director general of the Institute of Scrap Iron and Steel Inc., told the commission last week that "the inequality of the freight rate structure on scrap iron is one of the principal obstacles to the widespread collection and distribution of any economic supply of the principal raw material of the steel industry."

Railroad Defense May 25

J. K. Hiltner, traffic manager, United States Pipe & Foundry Co., Burlington, N. J., said the cast iron pipe industry has reduced every item of cost within its power, but was up against a stone wall in high freight rates. W. J. Butterfield, president, Vulcan Detinning Co., Neville Island, Pa., and E. R. Clark, traffic manager, Metal & Thermit Corp., New York, also urged reductions.

Beginning May 25 the railroads will put in a defense, though they do not need one.

□ □ □

The interdepartmental board of contracts and adjustments which has been looking into the purchase of steel made with foreign manganese ore has placed the matter in the hands of a subcommittee.

The matter comes before the committee at the suggestion of J. Carson Adkerson, president, American Manganese Producer's association, who has called attention to the "Buy American" section of one of the appropriation bills signed at the last session of congress.

The government board has no power to enforce its rulings or suggestions but makes them to the various purchasing officers of the government.

Following the appearance by the steel producers representatives before the board, Mr. Adkerson appeared a second time to present further detailed figures of manganese production.

□ □ □

One of the proposals following recent Diet approval of the bill calling for the merger of all private and governmental iron and steel plants in Japan is that as soon as the new merger corporation has been organized and is on a sound financial basis, the import duty on iron and steel products into Japan should be reduced, according to a report to the iron and steel division of the department of commerce from Assistant Commercial Attache Dowd, at Tokyo.

□ □ □

Acting upon the request of the Skoda Works, manufacturers of machinery and iron and steel products, the Czechoslovak government recently presented a proposition to the Polish government for gradual shipments of products made by the Skoda works to a total value of $3,600,000 against monthly imports into Czechoslovakia of 30,000 tons of Polish coal, according to reports received at Washington.

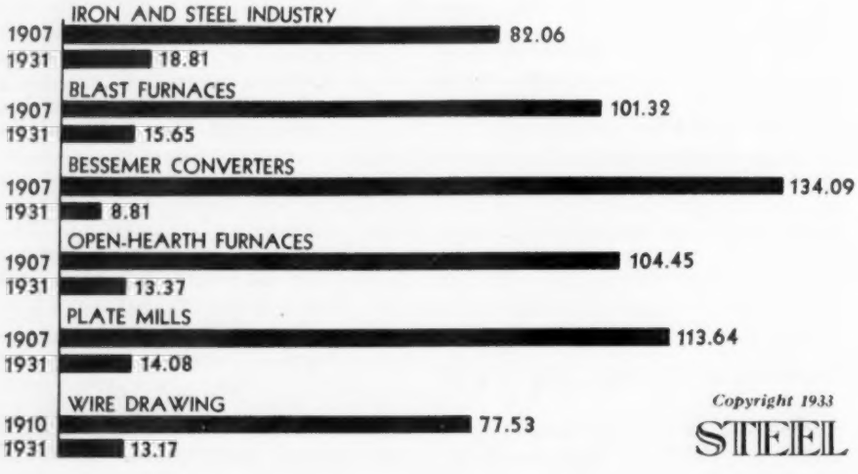
Iron and Steel Accidents Less Than One-Fourth Number 25 Years Ago

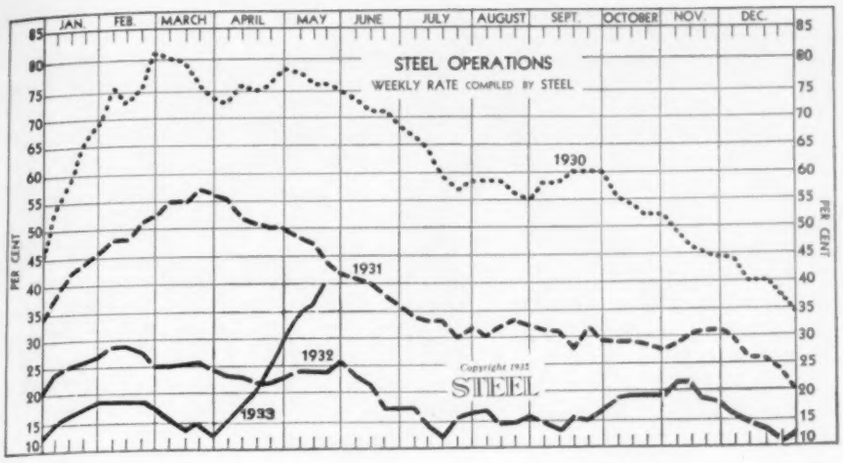
SAFETY measures in the steel industry have been so well organized that less than one-fourth the number of employes formerly injured now meet with accidents. The frequency rate of accidents in the industry in 1907 was 82.06 per 1,000,000 man-hours exposure; today the rate probably is between 18 and 19. The department of labor has just issued complete statistics showing that in 1931 the rate was 18.81, compared with 18.78 in 1930 and 26.03 in 1929.

The total number of injuries in the industry in 1931 was 32.3 per cent less than in 1930, but the reduction in man-hour exposure was 32.4 per cent, so that the frequency rate was only slightly affected. Intermittent and irregular hours of labor apparently have not resulted in carelessness and inexperience leading to an increase in accidents, despite the apprehensions expressed by some safety engineers at the outset of the depression.

The total amount of time loss due to accidents in 1931 was reduced 33.1 per cent, and consequently the severity rate, per 1000 hours exposure, was cut from 2.39 in 1930 to 2.37 in 1931. This severity rate for 1931 compares with 2.49 for 1929 and 6.9 in 1907.

The chart shows the reduction in frequency rates in the iron and steel industry as a whole, and in five of 31 departments classified by the department of labor.





Steel on Verge of Profit as Production Rate Reaches 40%

STEEL producers are on the threshold of profits. It was said that at 35 per cent the industry would do a little better than break even. In the week ended May 20 the steel rate rose 4 points to 40 per cent, entering the promised land.

Some companies have been out of the red since early in May; others, more topheavy, are in delicate balance. It appears, however, to be a safe forecast that the average steel company is now breaking even.

Steel began to lose money when it entered the zone of 50 to 55 per cent operations, on the way down. Economies effected through wage, manufacturing cost and other reductions are generally conceded to have lowered the twilight zone 20 points, and profits became possible at about 35 per cent, on the way up.

Earns on Preferred Stock

As an example, the Allegheny Steel Co., Brackenridge, Pa., has developed, as a result of the times, a "low pay point." This has been caused by actually lower production costs and other variables, including payrolls, which have been trimmed.

Allegheny in April, as a result, showed some earnings on the preferred stock after all charges, including depreciation. This showing was on a volume of business that was less than in April, 1932, when the company was in the red.

Republic Steel Corp., Youngstown, O., in April crossed the point where it began to cover $600,000 monthly in depreciation and other charges, and like Allegheny and other companies began adding to its cash. National Steel Corp., Pittsburgh, expects this quarter to double its first quarter profit.

The larger and fully integrated producers are slower coming back than the small specialty interests. The first quarter loss of the United States Steel Corp. was $18,531,676 and of Bethlehem Steel Corp. $5,769,451. These producers to an extent are more dependent upon volume than prices because of their fixed charges. At the worst, their second quarter statements will show their losses greatly reduced.

A possible result of the proposed industrial control measure is a simultaneous advance of wages and prices. As yet, no serious consideration has been given to wages, longer hours supplying the benefit to labor at this time.

Those districts not increasing their operations last week at least held their rate steady, pushing the average for the country up 4 points to 40 per cent.

Pittsburgh

Ingot operations at a full 25 per cent last week confirmed the anticipated advance of one point that was indicated ten days ago. This week, the rate appears headed for another one point gain to 26 per cent, when open hearths at Edgar Thomson division of Carnegie Steel Co. resume. At 26 per cent, the steelmaking rate is the highest for the year. There are now 9 out of 53 steelworks blast furnaces blowing here. During the week, Carnegie blew in one at Braddock, Pa., but Pittsburgh Steel banked its one active Monessen, Pa., stack for repairs. Of the nine active, five are operated by Carnegie, three by Jones & Laughlin and one by another independent.

Chicago

Steelmaking operations rose further last week, ingot production at 33 per cent being an increase of 2 points. This rate is expected to hold this week. Blast furnace operations are unchanged, seven of the district's 36 steelworks stacks being active.

Cleveland

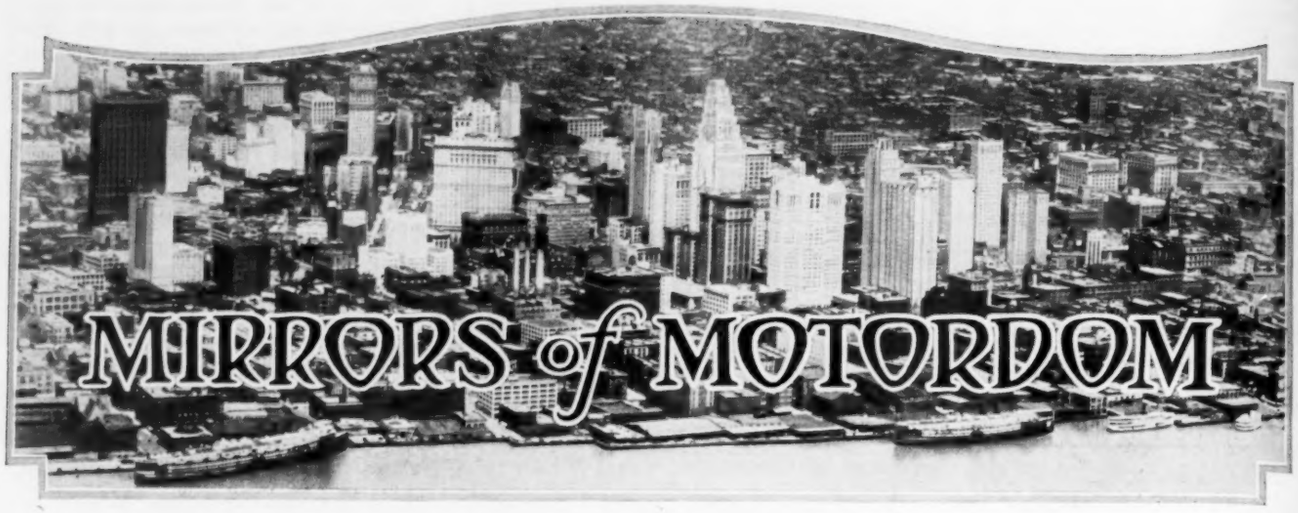
Steel ingot production here, including the Lorain district, averaged 58 per cent in the week ended May 20, up 4 points. The rate at the close of last week was 59 per cent, and it may pass 60 per cent the current week. Corrigan, McKinney Steel Co. operated ten open hearths all last week, and the Otis Steel Co. stepped

(*Please turn to Page* 51)

Operating Rate of the Steel Industry, by Weeks

All figures except the monthly open-hearth and bessemer ingot totals of American Iron and Steel institute are percentages. Estimates are based upon reports from Pittsburgh, Chicago, Youngstown, eastern Pennsylvania, Cleveland, Birmingham, Buffalo, Wheeling, Worcester and Detroit districts, which are weighted. Weeks end Saturday.

1932	1st Week	2nd Week	3rd Week	4th Week	5th Week	Steel's Average	Institute's Monthly Total tons	Institute's Monthly Average
Jan.....	22	25	26	27	28.5	25.7	1,454,309	25.86
Feb.....	28.5	27	25	25	....	26.4	1,450,648	26.83
March....	25	25.5	24.5	23	....	24.5	1,403,723	24.04
April.....	23	22	22	23	24	22.8	1,233,603	21.94
May.....	24	24	25.5	23	....	24.1	1,101,994	19.60
June.....	21	17	17	17	....	18.0	893,899	15.90
July.....	14.5	12	15.5	16.5	16.5	15.0	790,055	14.61
Aug.....	14.5	14.5	15.5	14.5	....	14.7	829,236	14.20
Sept.....	13.5	15.5	15	17	....	15.3	971,365	17.28
Oct.....	18	19	19.5	19.5	19.5	19.1	1,064,598	18.93
Nov.....	21	21	19	17.5	....	19.6	1,010,894	17.98
Dec.....	16	15	14	12	13	14.0	843,244	15.00
1933								
Jan.....	15.5	17	18	19	....	17.4	1,008,867	17.85
Feb.....	19	19	19	17	....	18.5	1,064,490	20.40
March....	15	13.5	15	14	15.5	14.6	891,153	15.18
April.....	17.5	20.5	25	29	....	23.0	1,334,797	24.56
May.....	33	36	40	..	....	....	.....	....



Hopes for Good Summer Rise

◆ ◆ ◆

Chevrolet Rate Now 65,000

◆ ◆ ◆

Great Lakes Steel Expanding

DETROIT

ORDINARILY late in May the automotive industry is over the crest of the spring rise in production and by easy stages is slipping into the summer lull. But this year the spring market matured late, for the first time since 1928 May output is exceeding April, and June gives indications of approximating May.

Consequently, unusual interest attaches to the probable activity of the industry during the normally dull months of July and August. Especially with raw materials strengthening in price and the nation shaking off the lethargy of four years of depression is the automotive industry attempting to read farther ahead than usual.

With the reservation that any forecast 60 to 90 days ahead is hazardous, it may be said that each succeeding week supports the view that summer business of the industry will be surprisingly heavy. The worst that is being said of July and August is that the dip will be less than seasonal, the best that the May and June rate of approximately 200,000 units will be maintained.

Base of Demand Broadening

The industry still refuses to regard the present improvement, which has attained the proportions of 60 per cent of normal, as genuine recovery. It insists that this will come only when railroad labor again is in position to buy automobiles and the advances in grain and cotton prices percolate back to the farmers of the West and South.

But unquestionably the base of buying power is being broadened. Thus far the great bulk of new car demand has originated in the East, traceable in large measure to the release of funds through the subsidence of fear. For example, one manufacturer in normal times expects his New York and St. Louis district assembly plants to run neck and neck, but now New York leads 2 to 1.

Very little buying has been stimulated by increased employment in the industrial East, but this appears to be approaching. As one executive puts it, give the average employe another month's work at full time and he will start buying. This is an augury for July and August production.

Also give fleet owners—usually large corporations—another month of good business and their confidence will be restored sufficiently to release some buying. For all practical purposes there has been no fleet buying for three years, and the low-price cars comprising these fleets are frankly what the industry calls 2-year cars—that is, cars designed to be operated in heavy service for 2 years without major repairs.

American Telephone & Telegraph Co., largest fleet owner, operates over 20,000 automobiles in normal times. As Detroit views it, continued improvement in business will warrant capital expenditures, and the threat of an advance in price will be a contributing factor. Hence the prospect of fleet buying supplying some momentum this summer.

Not all of the automobile buying this spring and summer will be judicious. In Detroit, for example, there are workers who regularly buy in the spring and are dispossessed in the fall. The larger financial companies will not treat with this class of buyers, but there are companies that take the chance. This class of buyers is beginning to be active. Automobile manufacturers recognize that this is not a healthy condition, but they will not discharge any worker for buying a new automobile.

Chrysler, with an esprit de corps, aggressiveness and flexibility that is the envy of other manufacturers, is proceeding on the basis that this will be a good summer. It is talking and acting confidently, and is covering farther ahead on raw materials than its competitors.

General Motors counsels are divided. The Knudsen unit, which is accounting for 90 per cent of all sales, is represented as seeing no worse than a moderate decline in July and August. Even those in General Motors who are less optimistic are careful to leave open an avenue of escape.

Neither the election of Mr. Roosevelt nor the return of beer having downed the country as Henry Ford feared, he has recovered his courage sufficiently to launch a $600,000 advertising campaign. Whatever Detroit may think of Mr. Ford, it regards him as too canny to address a moribund public.

Three Making 175,000 Cars

These three groups, all manifesting fair to pronounced confidence in the summer market, are assembling about 175,000 units this month—General Motors 90,000 and Ford and Chrysler each 45,000. This total is nearly four times the depression low of October, 1932. Even the pessimists do not look for mid-summer production to go off more than 20 per cent, which would still leave a wide margin over the all-time low. And the adherents of a good summer are steadily becoming more numerous.

Chevrolet-Pontiac, which has a new automatic transmission ready for production and may be the first General Motors unit to eliminate the gearshift lever, is holding a 10 per cent increase over April. Chevrolet assemblies are at the rate of 65,000 units this month, compared with 59,000 in April, while Pontiac is crossing 10,000 units, against 8100 in April. These rates are slightly be-

(*Please turn to Page* 53)

Industrial Men in the Day's News

Dr. W. H. Hatfield, Awarded Bessemer Gold Medal for 1933

FOR extraordinary accomplishments in the field of metallurgy, one of the most coveted honors in Great Britain is his.

NOW director of the Brown-Firth Research Laboratories in Sheffield, he has enjoyed a comprehensive career.

HE has done much work on rustless steels. His book on cast iron is a standard authority. In 1928 he gave the A. S. S. T. Campbell lecture.

DR. W. H. HATFIELD, director of the Brown-Firth Research Laboratories, Sheffield, Eng., and technical adviser to Thomas Firth & John Brown Ltd., of which he is a local director, has been awarded the Bessemer gold medal for 1933. The award was made at the annual meeting of the Iron and Steel institute in London, May 4.

Doctor Hatfield, who was Mappin medallist and associate, Sheffield University college in 1902, began his works career in the laboratory of H. Bessemer & Co. Ltd. After two years he became associated with Meadow Hall Works of J. Crowley & Co., subsequently joining the board of that company as technical director. In 1915 he assumed control of the Brown-Firth Research Laboratories and was adviser to Thomas Firth & Sons Ltd. and John Brown & Co. Ltd., these latter companies being merged in 1930.

Doctor Hatfield has done eminent research work in the rustless steel field. His work on properties of steel at high temperatures is well known. He also has done valuable investigation work in connection with the special committees of the Iron and Steel institute on "Heterogeneity of Steel Ingots" and "Corrosion," of both of which committees Doctor Hatfield is chairman.

His book on "Cast Iron in the Light of Recent Research" is a recognized work on the subject. In 1928 Doctor Hatfield gave the Campbell memorial lecture before the American Society for Steel Treating. He was first president of the Sheffield Association of Metallurgists and Metallurgical Chemists. In 1913 he received the degree of doctor of metallurgy from the University of Sheffield.

WILLIAM P. WITHEROW, prominent Pittsburgh industrialist, has been elected president of Steel Products Co. Inc., McKees Rocks, Pa., jobber of sheets, plates, bands and other steel products. Mr. Witherow formerly was president of the Witherow Steel Co., Pittsburgh, prior to its merger with the Donner Steel Co. of Buffalo and the subsequent amalgamation of the latter with Republic Steel Corp., Youngstown, O.

In addition, Mr. Witherow is a director of Keystone Driller Co., Beaver Falls, Pa., First National Bank of Pittsburgh, and Peoples-Pittsburgh Trust Co., as well as president and director of the Spencer Mfg. Co., Spencer, O.

□ □ □

Douglas J. Henecker has been appointed district sales manager in the Buffalo district for the Wickwire Spencer Steel Co., New York. Mr. Henecker had been acting manager for this company at Buffalo since Jan. 1, 1932. Prior to that he was assistant manager of the rope and electrical sales department of the American Steel & Wire Co., in New York.

□ □ □

L. H. Burnett, vice president, Carnegie Steel Co., Pittsburgh, addressed the annual dinner given by Dr. Thomas S. Baker, president, Carnegie Institute of Technology, for the 1933 graduating class, May 18.

□ □ □

J. T. M. Stoneroad, president, Carnegie Coal Co., Pittsburgh, has been elected a director of the Carnegie Northern Fuel Co., which is a new corporation formed at Minneapolis last week by the combination of the Carnegie Dock & Fuel Co., Minneapolis, and the Northern Coal & Dock Co., St. Paul.

□ □ □

Edgar C. Bain, research metallurgist, United States Steel Corp. laboratories, Kearny, N. J., was prominent in addresses given in two groups of public lectures May 16 and 17 at the Carnegie Institute of Technology, Pittsburgh.

□ □ □

Myron C. Taylor, chairman, United States Steel Corp., sailed for Europe May 12 to attend a business conference. He will return early in June.

□ □ □

Leroy Holt, purchasing agent, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., has been elected president of the Purchasing Agents Association of Birmingham.

□ □ □

Dr. James Aston, head of the min-

ing and metallurgical department of Carnegie Institute of Technology, Pittsburgh, and inventor of the Aston process for producing wrought iron, will be honored with an honorary degree at the annual commencement May 19, of the University of Wisconsin, Madison, Wis.

□ □ □

S. P. Wallace, formerly East Texas district manager, Parkersburg Rig & Reel Co., Parkersburg, W. Va., has been made manager of North Texas division office in Dallas, Tex.

□ □ □

Joe M. Fuller, Mid-Continent sales representative, Bartlett-Hayward Co., Baltimore, has moved his headquarters from Tulsa, Okla., to Fort Worth, Tex.

Nominated for Officers Of Testing Society

T. R. Lawson, head, department of civil engineering, Rensselaer Polytechnic institute, Troy, N. Y., has been nominated for president of the American Society for Testing Materials. Hermann von Schrenk, consulting timber engineer, St. Louis, is the nominee for vice president.

Nominated to serve as members of the executive committee are the following: F. A. Barbour, consulting hydraulic and sanitary engineer, Boston; A. C. Fieldner, chief engineer, experiment station division, bureau of mines, Washington; C. N. Forrest, representative, Barber Asphalt Co., Philadelphia; J. C. Pearson, director of research, Lehigh Portland Cement Co., Allentown, Pa.; and A. E. White, professor of metallurgical engineering and director of engineering research, University of Michigan, Ann Arbor, Mich.

The election will be conducted by mail ballot with the new officers assuming their positions at the close of the annual meeting of the society in Chicago, June 26-30.

Sheet Sales and Production Up Sharply in April

Sheet steel sales and production figures reported by the National Association of Flat Rolled Steel Manufacturers, Pittsburgh, show good gains for April. Daily average sales increased to 3953 net tons, from 2687 tons in March; production, 3731 tons, from 2083 tons; and shipments, 3345 tons, from 2415 tons.

Total sales for April were 118,594 tons; production, 111,942 tons; and shipments, 100,353 tons. Unfilled tonnage May 1 was 111,311 tons, 91,993 tons April 1. Total sheet capacity in the country for April was approximately 550,000 tons, and the capacity on which the association's figures are based was 325,000 tons.

Died:

WILLIAM H. CREAHEN, 70, well-known steel mill operating man of more than a decade ago, at Youngstown, O., recently. Most of his business career was spent in the Pittsburgh and Youngstown, O., districts and he entered business at an early age so that when but 19 years old he was in charge of the furnace department of the old Pittsburgh Tool Co. A few years later he rebuilt the McCutcheon mill in the Soho district of Pittsburgh, and in 1901 built the first tube mill for the present Youngstown Sheet & Tube Co., and was the first superintendent of it. Several years later, Mr. Creahen became superintendent for Spang Chalfant & Co.'s Etna, Pa., tube works, and at a later date helped in the construction of the Montreal Rolling Mills Co., Montreal, Que. About 1923 he retired, and had been living at Santa Monica, Calif., until he came east recently to visit his daughter at Youngstown, where he died.

□ □ □

William H. Hassenplug, 69, former vice-president of the Harnischfeger Corp., Milwaukee, May 9. He was born in Mifflenburg, Pa., and attended Bucknell College, entering business with William Sellers & Co. Inc., Philadelphia. He joined the old Pawling & Harnischfeger Co. in Milwaukee, in 1900 and retired a year ago.

□ □ □

John A. Ubsdell, 66, president and general manager of the Great Lakes Engineering Works, Detroit, May 15. He became associated with the Chicago Shipbuilding Co. in 1890, going to Detroit in 1902 as superintendent of the shipbuilding division of the newly-organized Great Lakes Engineering Works.

□ □ □

Emil C. Ertzman, 80, retired superintendent, Continental works of National Tube Co., Pittsburgh, at Pittsburgh, May 15.

□ □ □

David A. Shaw, 67, general manager, Monmouth Products Co., automobile parts manufacturer, Cleveland, May 12.

□ □ □

Joseph P. Childress, 35, secretary-treasurer, Reynolds Metal Co., Louisville, Ky., May 11.

□ □ □

Alexander S. Vaughan, 37, vice president, Vaughan & Bushnell Mfg. Co., Chicago, manufacturer of hardware and forgings, May 14.

□ □ □

Fred J. Hanson, 54, experimental engineer in charge of research laboratories, Wisconsin Motor Co., Milwaukee, May 12. He was born in Milwaukee and became connected with the motor company in 1908.

□ □ □

William J. Burleigh, 66, manufacturer of ornamental iron, Sterling, Ill., May 11.

□ □ □

John R. McNeill, 52, owner of the Columbia Iron Works, Brooklyn, N. Y., at Miami Beach, Fla., May 1.

□ □ □

J. W. Bettendorf, 68, president of the Bettendorf Co., Bettendorf, Iowa, May 17. Starting as machinist in a plow works at Peru, Ill., he ultimately headed the freight car building and repair company bearing his name.

Altoona Puddled Iron Mill Is Being Dismantled

Altoona Iron Co. puddled iron mill at Altoona, Pa., which has been in operation for 60 years and which for many years supplied refined iron bars, staybolt iron, etc., largely to the Pennsylvania railroad shops at Altoona, is being dismantled.

Incorporated July 10, 1873, the company at first operated a half dozen puddling furnaces. The center around which the mill originally was built was the Allegheny blast furnace, a charcoal stack erected in 1810 to reduce hematite ore.

The mill's equipment recently included 28 puddling furnaces, 5 heating furnaces, 4 trains of rolls and a 3-ton drop hammer. In its later years, Joseph D. Findley was president, Russell McCauley general manager and purchasing agent, and William W. Grove general superintendent.

Now Cover on Silicosis

Wisconsin Workmen's Compensation Insurance board has broadened its coverage to include occupational diseases such as silicosis, in connection with foundry and stonecutting operations. The new plan provides for imposition of a 25 per cent debit upon the payroll of all foundry operations, 5 points of which can be removed by compliance with the regulations of the commission in respect to eradication of silica dust and the remaining 20 if tests prove that silica dust is below the safety limit.

Realigns Gary Properties

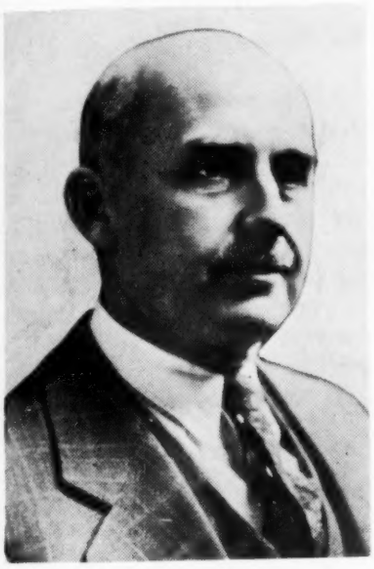
United States Steel Corp. has made an adjustment in the holding companies of two subsidiaries at Gary, Ind. The Gary Tube Co. properties have been transferred to the National Tube Co. and the Indiana Steel Co. plant at Gary, which has been operated by the Illinois Steel Co., formally passes to the latter.

On American Iron and Steel Institute Program

Speakers at New York Meeting May 25

CHARLES F. KETTERING, who will speak on "The Use of Research in Industrial and Commercial Progress," is president, General Motors Research Corp., New York. He was born on a farm in Ashland county, Ohio, Aug. 29, 1876. Graduated from Ohio State university in 1904, for a short time he installed telephones and then went to the National Cash Register Co., Dayton, O., as an inventor and engineer. His next venture was the organization of the Dayton Engineering Laboratories to manufacture some of his most important inventions, automobile starting, lighting and ignition systems. He also became identified with a number of other Dayton industrial corporations. During the World war his inventive ability contributed in many ways to electrical, mechanical and aeronautical developments initiated for the government. In 1927 he received an

Charles F. Kettering



Dr. Anson Hayes

Everett Chapman

Dr. John Johnston

H. G. Marsh

election as honorary member of the American Society for Steel Treating.

♦ ♦ ♦

FRANCIS H. SISSON, who will speak on "The Financial Situation and Its Relation to Business Recovery," is president of the American Bankers association, and vice president of the Guaranty Trust Co. of New York. He was born in Galesburg, Ill.; was graduated from Knox college, that city, and also from Harvard university. He was asociated with newspapers in Illinois, and subsequently with a national advertising agency in New York. Prior to his connection with the Guaranty Trust company, he was assistant chairman of the advisory committee, Association of Railway Executives. Mr. Sisson is a member of the American Economic association, Academy of Political Science, Phi Beta Kappa, and Beta Theta Pi. He was made a Chevalier of the Order of the Crown by the King of Belgium in recognition of his services during the war. He is president of the Town Hall

(*Please turn to Page* 60)

E. F. Entwisle

EDITORIAL

U.S. Asks for Code; Can Steel Industry Draft It Promptly?

WASHINGTON is losing no time in drafting the terms for the forthcoming "partnership" of government and industry. In the White House and on Capitol hill the administration and congress have been working diligently to introduce a workable plan for helping industry to shake off the curse of cut-throat competition so that employment may be increased and that profits may replace deficits.

Through several weeks of consultation and negotiation, resulting in the gradual refinement of ideas, the administration by Wednesday of last week was sure enough of its ground to justify the submission of a message to congress urging prompt action. The President asked that the necessary machinery be provided "for a great co-operative movement throughout all industry in order to obtain wide re-employment, to shorten the working week, to pay a decent wage for the shorter week and to prevent unfair competition and disastrous overproduction."

Industry Asked To Form Own Rules and Government Will See To Their Observance

Senator Wagner of New York, co-author of the administration plan, offered this explanation of its objectives and method of operation: "The purpose is to secure co-operative action within industry with a view to eliminating unfair competitive practices and thereby to reduce unemployment, improve standards of labor and otherwise to rehabilitate industry. The bill authorizes any group or association within a trade or industry to prepare a code of fair competition which sets forth the standards covering trade and competitive practices within that industry. Such a code is without effect until it is approved by the President."

This proposal is eminently fair to industry. It affords an opportunity to each industrial group to write its own rules, subject to the approval of the President. This feature of self-regulation, with government policing, should be welcomed by all industries. The government offers industry a pulmotor, and not the strait-jacket that was indicated by certain congressional utterances in the early days of discussion on the "control" of industry.

That the administration decided that a pulmotor is more appropriate than a strait-jacket is due, first, to the studied judgment of the President and some of his advisers and, secondly, to the excellent liaison activities of certain industrial organizations, notably the National Association of Manufacturers. To the credit of the steel industry it may be said that a number of its representatives participated actively in the work of the National Association of Manufacturers.

Steel Institute Has Golden Opportunity To Do Signal Service for Its Sponsors

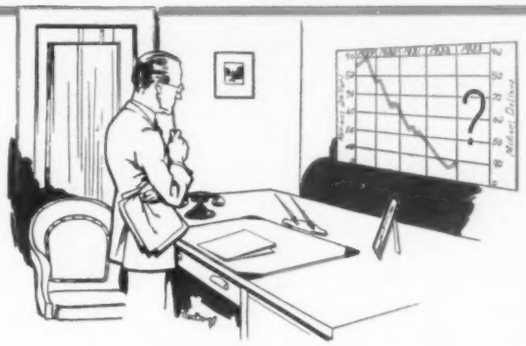
What congress will do with the bill is open to speculation. Doubtless attempts will be made to load it with riders, some of which may be dangerous to industry. The industrial organizations now ably represented in Washington may be trusted to guard against unwarranted tinkering with the bill in its progress through house and senate. Perhaps the steel industry, as before, can rely safely upon the National Association of Manufacturers and other on-the-job organizations for efficient performance of this important service.

As for drafting a code of trade practice for the steel industry, this is a job that cannot be delegated to others. Of course the efficient American Institute of Steel Construction can be counted upon to act for the construction division of the industry. Other groups will take care of their own codes. But what about the hot-rolled branch of the industry? How can it meet the government's request for a code except through the agency of the American Iron and Steel institute? Is the institute alert to the need and to the opportunity for invaluable service?

Action rather than opinion will provide the answers to these questions. In the past, mobilization of the strength of the industry through the agency of the institute has been slow and clumsy. The machinery has been ponderous, and its functioning has proved ineffective.

The present challenge should serve as a final test of the machine. If it fails in this golden opportunity, it should be rebuilt. If it meets the test successfully, it will deserve the unstinted support of the industry to a greater extent than ever before.

THE BUSINESS TREND



Gains Continue, But Not All Industries Share in Upturn

IMPROVEMENT in business, which several weeks ago had affected only a few industries, gradually is broadening out. A few days ago Standard Statistics Co. reported that 15 industries or divisions of industries were operating at higher levels than at the corresponding time in 1932. The list embraced aircraft, automobiles, automobile parts, food products (flour milling and meat packing), soap, shoes, metal containers, nonferrous metals (gold and silver), crude oil, railroads (freight traffic and car leasing), retail trade (gross volume), steel and iron, sugar refining, textiles and cigarettes.

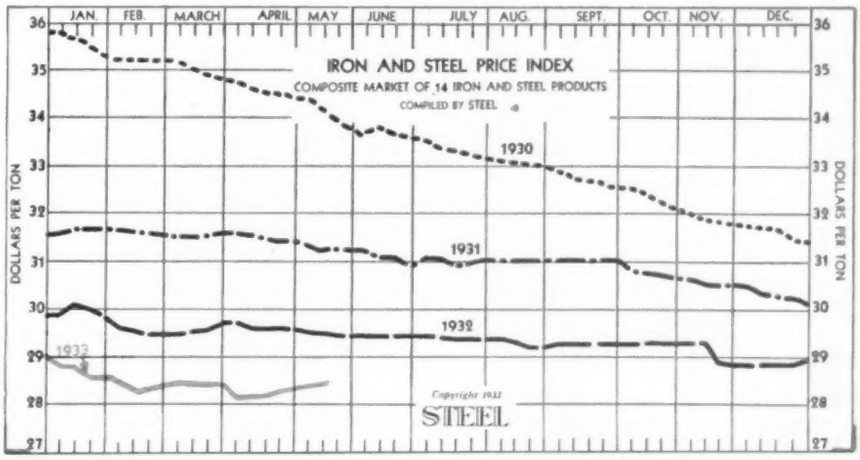
While this showing is impressive and while a few other sections of industry might properly be added to the list, the fact remains that business improvement still is somewhat spotty. Numerous manufacturers in diverse lines of industry declare that they see signs of greater activity around them but that no evidence of improvement has appeared in their own business. Here and there are companies whose orders in April were below those of March. It is unwise to generalize on the basis of encouraging reports from a few industries.

Owing to a poor showing among eastern railroads, car loadings in the week ending May 6 did not come up to expectations, and the 1933 line did not cross the 1932, as had been anticipated from the preliminary reports of western roads. Again the loadings of the western systems for the week ending May 13 hold faint promise that the trend lines may cross, but again the decision will rest with the showing of the eastern railroads.

U. S. Partnership with Industry and European Situation Hold Attention of Business

Many of the progressive industries are acting promptly to offer assistance to the government in planning for its "partnership" with industry. A few industries have drawn up complete plans for self-regulation, which require only the police power of government co-operation to make them effective.

Business also is watching the European situation closely. Hitler's address on Wednesday was less provocative than expected. If the tenseness of the present situation is relieved soon, interest will swing quickly to the forthcoming economic conference.



1933

May 13	$28.33
May 6	28.29
April 29	28.20
April 22	28.18

1932

May 14	$29.64
May 7	29.68
April 30	29.70
April 23	29.74

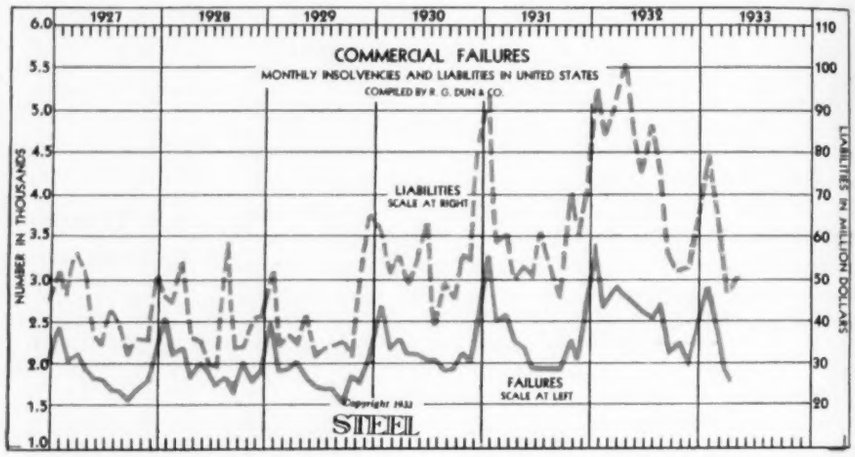
March, 1933	$10,548,004
February, 1933	9,802,272
March, 1932	32,611,343

Railroads Earn Only 0.67% In First Quarter

Although earnings of class 1 railroads of the United States during the past few months have presented a dismal record, March, however, did show a slight upturn. Net earnings for the third month total $10,548,004, which was at the annual rate of return of 0.52 per cent and compares with $9,802,272 in February and $32,611,343 in March, 1932. During the first quarter of this year the roads have earned only $33,909,385, or a return of 0.67 per cent on their property investment.

April Business Failures Reduced to 1930 Level

Commercial failures in April continue to show a further reduction, both in the number and in the amount of indebtedness. According to Dun & Bradstreet Inc., there were 1,921 business failures in April. This is the lowest number of defaults since August, 1930, and compares with 1948 failures in March and 2816 in April, 1932. Liabilities reported in April this year were $51,097,284, compared with $101,068,693 in April last year.



Number		Liabilities	
April, 1933	1,921	April, 1933	$51,097,284
March, 1933	1,948	March, 1933	48,500,212
April, 1932	2,816	April, 1932	101,068,693

April, 1933	14.9
March, 1933	20.1
April, 1932	37.1

Machine Tool Buying Index Remains Low

The buying wave that has made its appearance in many lines started too late in April to reflect an upturn in the machine tool industry. The three-month moving average for the fourth month of this year was 14.9, compared with 20.1 in March and 37.1 in April, 1932. According to the National Machine Tool Builders association, the shipment index for April dropped two points to 19.7, while unfilled orders eased off one point to 26.9.

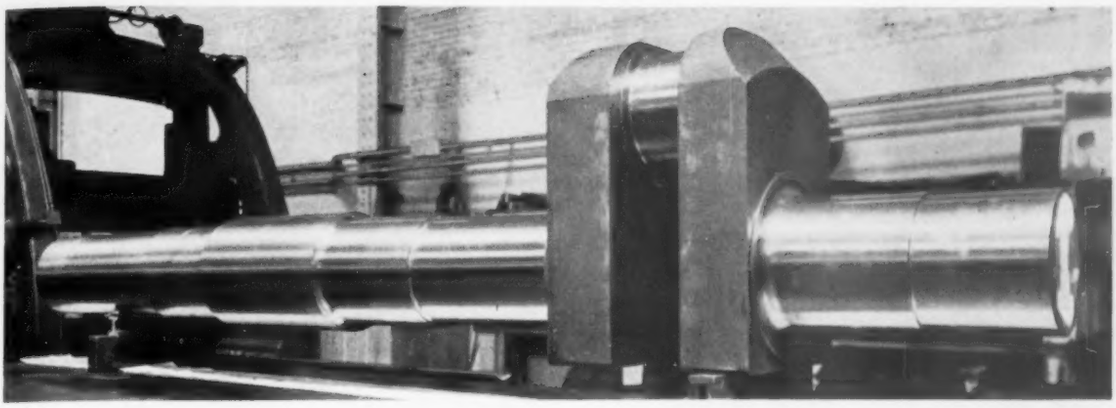


Fig. 6—A nickel-chrome-molybdenum steel crankshaft, normalized and drawn. Finished weight is 11,655 pounds. The journals are 17 inches diameter, the webs 37 x 22 inches and the length 14 feet 6 inches

DEVELOPS NICKEL-CHROME-MOLYBDENUM STEELS FOR HEAVY-DUTY FORGINGS

Part II

(Part I appeared in the May 15 issue of STEEL)

BY M. R. CHASE

Chief Metallurgist, A. Finkl & Sons Co.

TYPE 2 steel, containing 0.35-0.45 carbon, 0.55 manganese, 0.75 chromium, 1.50 nickel, 0.25 molybdenum and 0.25 per cent silicon, was developed for medium-size forgings which can be quenched or for which quenching is not practical, to develop fairly high properties with a normalize and draw treatment. Slightly higher properties can be developed in this steel on medium sections than on the same section from Type 1.

This steel can be water quenched in sizes around 4 inches and over, but should be oil quenched in the small sections. Physical properties obtained from Type 2 steel, tested at a midway point between surface and center, are shown in Table III.

This type of steel is good for all forms of shafting, crankshafts, axles, gears and the like. Higher physical properties than those outlined, can be obtained, but if higher properties are desired, ductility will be lowered accordingly. The figures given in Table III are about the average strengths required in usual design and the steel is ductile at these figures. This steel gives a good wearing surface and is highly resistant to torsional stresses.

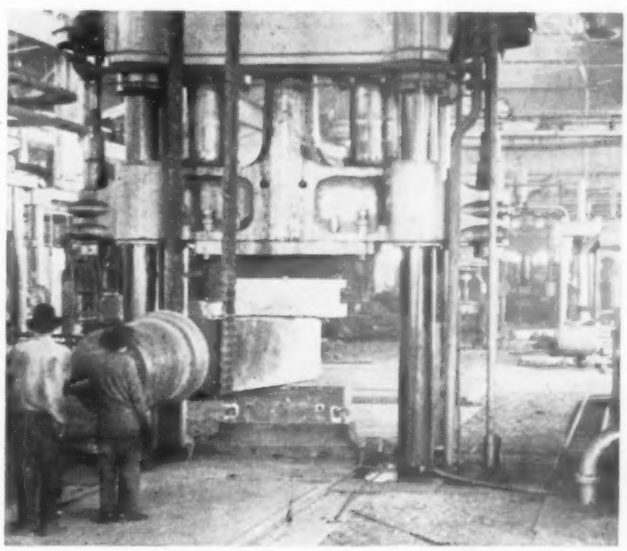


Fig. 7—Forging a nickel-chrome-molybdenum steel die block from a 26 x 42-inch bloom which has been cogged from a 64-inch ingot. Weight of the ingot was 165,300 pounds

Type 3 steel, containing 0.50-0.60 carbon, 0.55 manganese, 0.75 chromium, 1.50 nickel, 0.30 molybdenum and 0.25 per cent silicon, was developed for use in large forgings which can be quenched and in which deeper hardness penetration is desired. It was intended for use also in large intricate-shaped forgings which can not be quenched safely or with which quenching is not desired. In the case of forgings of this latter type, the steel is used in the annealed or normalized and drawn condition. Higher physical properties can be developed on large sections with this type than with Type 2. This is a full oil-quenching and semi air-hardening

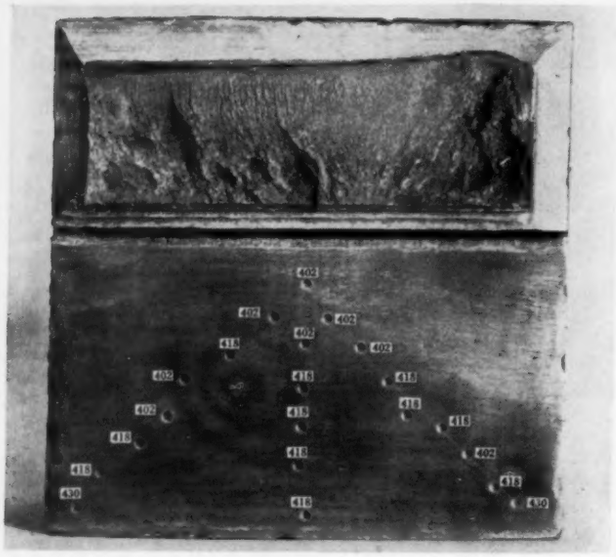


FIG. 8—This 6-inch square nickel - chrome - molybdenum die block, air hardened and drawn at 1000 degrees Fahr., was split in half for brinell hardness tests

steel. One of its greatest uses is for drop hammer die blocks, the greater percentage of die blocks used today being made from this steel or a slight variation from it.

Used in die blocks, this steel shows minimum distortion in the heat treating operation and hardens to great depth. Due to the inherent toughness and the balanced hardening characteristics, the breakage of dies in the heat treating operation and in service has been practically eliminated. General machining operations can be conducted at a higher hardness than on former die blocks, the steel has more resistance to heat checking and greater production can be obtained per die block.

These die blocks range in size from 6-inch sections up to 20 x 45-inch sections and have weights ranging from 100 up 14,000 pounds each. Great numbers of these dies are quenched and used at high hardnesses. It is essential that they be as uniform as possible in hardness from surface to center. An example of the size in which this material is being used is given in Fig. 7.

When utilized in various types of shafting and machinery parts of large section, this steel generally is annealed or normalized and drawn, because, due to its high natural strength, it can be used in a more normal state than the older types. Strains and stresses are fully relieved by the higher drawing temperatures employed and the steel is freer from temper brittleness. Fig. 6 shows a normalized and drawn crankshaft which gave the following properties when tested midway of the 17-inch section: Tensile strength, 120,000 pounds per square inch; yield point, 90,500 pounds per square inch; elongation in 2 inches, 20.0 per cent; and reduction of area, 42.0 per cent.

Comparable to 13-Inch Section

It will be noted that physical properties have been obtained in a 17-inch section by normalizing and drawing comparable to those obtained with Type 1, quenched and drawn, on a 13-inch section.

Further examples in which similar treatments are used are shown in the sketches in Fig. 9. Forgings of this type consist of large rotor and pinion shafts, pins and trunnions, and the like. The following actual tests were taken from a series of normalized and drawn forgings of the second type, Fig. 9, when taken midway:

Tensile Strength, pounds per square inch	Yield Point, pounds per square inch	Elongation in 2 inches, per cent	Reduction of area, per cent
104,550	78,550	22.5	46.3
102,325	78,125	23.5	46.0
105,750	75,750	22.5	46.3

It will be noted how uniform these tests are, yet they were taken from individual forgings made from three distinctive melts of steel.

For general high strength machinery purposes, such as crankshafts and shafting which can be quenched and drawn, this steel gives an excellent

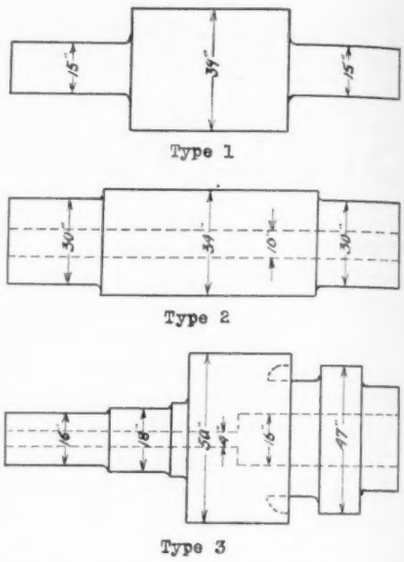
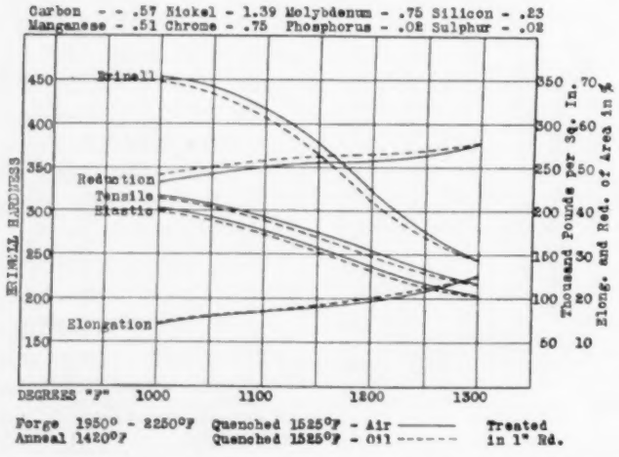


Fig. 9 — Nickel-chrome-molybdenum steel of Type 3 has high natural strength and forgings of the type shown here require only normalizing and drawing


Carbon - - .57 Nickel - 1.39 Molybdenum - .75 Silicon - .23
Manganese - .51 Chrome - .75 Phosphorus - .02 Sulphur - .02
Brinell
Reduction
Tensile
Elastic
Elongation
BRINELL HARDNESS
Thousand Pounds per Sq. In.
Elong. and Red. of Area in %
DEGREES "F"
Forge 1950° - 2250°F
Anneal 1420°F
Quenched 1525°F - Air
Quenched 1525°F - Oil
Treated in 1" Rd.

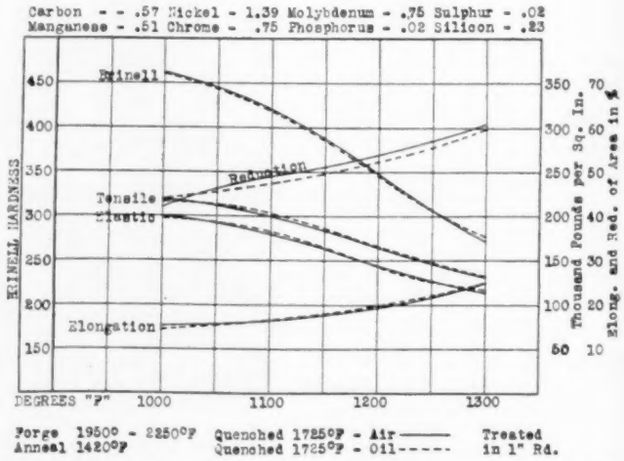

Carbon - - .57 Nickel - 1.39 Molybdenum - .75 Sulphur - .02
Manganese - .51 Chrome - .75 Phosphorus - .02 Silicon - .23
Brinell
Reduction
Tensile
Elastic
Elongation
BRINELL HARDNESS
Thousand Pounds per Sq. In.
Elong. and Red. of Area in %
DEGREES "F"
Forge 1950° - 2250°F
Anneal 1420°F
Quenched 1725°F - Air
Quenched 1725°F - Oil
Treated in 1" Rd.

Fig. 10 (Left)—Physical properties of Type 4 nickel-chrome-molybdenum steel used in small sections and air hardened. Fig. 11 (Right)—Physical properties of the same steel when hardened in air and in oil from comparatively high temperature. The results compare favorably with those of Fig. 10

wearing surface and is highly resistant to torsional stresses. The figures given in Table IV are examples of the properties developed in various sections which have been oil quenched and drawn to different specifications.

Type 4 steel, containing 0.50-0.60 carbon, 0.55 manganese, 0.80 chromium, 1.50 nickel, 0.75 molybdenum and 0.25 per cent silicon, was developed for specialty uses and is a full air-hardening steel, but may be oil quenched if desired. This type of steel was developed for specialty uses on small and medium-size forging dies, hot work tools, inserts, forging rolls, and the like. Hardnesses of 85 scleroscope or 652 brinell can be obtained by either air or oil treatment. An example of its air hardening qualities is shown in Fig. 8.

Resistant to Heat Checking

The physical properties developed in this steel when hardened in air or in oil from the lowest temperature at which air hardening is practical on small sections, are shown in Fig. 10. When oil hardened at lower temperatures than shown in chart, the physical results did not show any improvement over those given. Fig. 11 shows the results obtained with this same steel when hardened in air and in oil from a comparatively high temperature. It will be noted that these results compare favorably with those of Fig. 10. Air-hardened dies and forging tools made from this steel are exceptionally resistant to heat checking.

Many other types of nickel-chrome-molybdenum steel are being developed for special needs and purposes. Fig. 12 gives the properties that can be developed on still another type which is an excellent steel. A very good example of the adaptability of nickel-chrome-molybdenum steel for important parts was the free use made of it by Sir Malcolm Campbell in his Bluebird racing car, world record holder. Various types of this steel were used in the crankshaft, connecting rods, clutch, propeller shaft, rear and front axle, steering gear and control levers. This is but another instance of where this steel has been tried and proved.

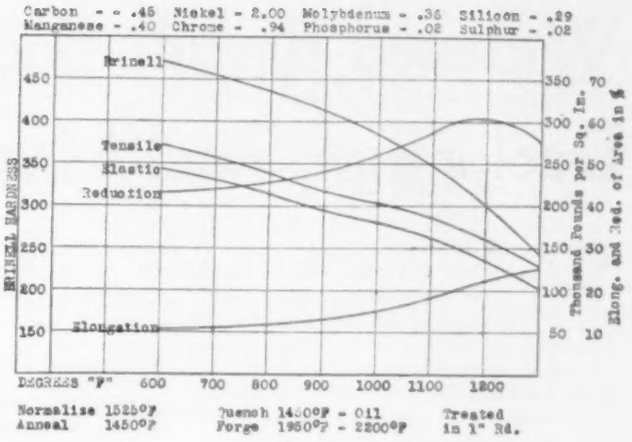


FIG. 12—Types of nickel-chrome - molybdenum steel are developed for special purposes. This chart shows physical properties of one excellent type

Exhibitors Group Forms An Advisory Unit

Exhibitors Committee Industrial and Power Shows Inc., 330 West Forty-second street, New York, has organized a member's advisory committee which will function as a consulting group to give advice and assistance on any show problem to member exhibitors.

Although large in membership, this committee will seldom, if ever, act as a whole. Upon receipt of a request for assistance, the president will designate those members whose experience qualifies them to handle the particular request. By this concentrated grouping of exhibit experts, a member will be assured of quick, accurate answers given by corporation representatives whose experience in exhibits covers many years.

Among corporations serving on the committee are: American Brass Co., American Car & Foundry Co., Babcock & Wilcox Co., Consolidated Ashcroft Hancock Co., Consolidated Gas Co. of New York, Crane Co., General Electric Co., International Nickel Co., Jenkins Bros., Johns-Manville Corp., Link-Belt Co., National Tube Co., National Aluminate Corp., S K F Industries Inc., Texas Co., Timken Roller Bearing Co., Walworth Co. and Westinghouse Electric & Mfg. Co.

Russia Revises Practice For Standards Making

A revolution in the industrial standardization activities of the Soviet Union involving the shifting of responsibility for standards making from a central organization to the various industries which use the standards, and with less emphasis on political slogans and more on fundamental research, was described in the April issue of *Industrial Standardization* published by the American Standards association, 29 West Thirty-ninth street, New York.

In an article based on a report by A. K. Gastev, the new chairman of the All-Russia committee on standardization, it was stated that the new set-up brings the standards making practice of the U.S.S.R. into close semblance with the practices of the United States and other countries having national standardizing bodies.

Instead of itself formulating standards, the All-Russia committee will engage the support of research organizations and exercise a guiding influence on the making and the enforcing of standards by the industries. Special emphasis will be placed on standards for machine construction, metallurgy and fuels.

Table III

Physical Properties of Type 2 Steel

Size, diameter in inches	Treatment	Tensile Strength, lbs. per square inch	Yield Point, lbs. per square inch	Elongation in 2 Inches, per cent	Reduction of Area, per cent
9	Normalized and drawn	108,425	78,250	20.0	45.2
8	Oil quenched and drawn	126,875	103,250	19.0	59.4
6½	Water quenched and drawn	136,500	114,125	18.5	57.3
8	Water quenched and drawn	129,300	103,250	19.0	58.2
12	Water quenched and drawn	125,000	97,050	18.0	52.0

Table IV

Physical Properties of Type 3 Steel

Size, diameter in inches	Tensile Strength, lbs. per square inch	Yield Point, lbs. per square inch	Elongation in 2 Inches, per cent	Reduction of Area, per cent	Brinell Hardness
5	161,125	138,250	15.0	50.0	302
7	134,375	99,500	19.5	58.6	255
7	157,875	122,125	15.0	46.0	293
7	165,125	137,500	14.0	44.0	302
8½	139,100	116,575	20.0	56.2	277
8½	152,750	125,900	14.0	38.0	302
9	143,800	111,000	16.0	52.4	.....
11	163,100	131,750	11.0	34.1	311

Widened Bascule Bridge Has Decking of Steel Mesh

HOW to widen a bascule bridge to accommodate greatly increased traffic and yet not to exceed weight limits imposed by counterbalances and operating machinery was the problem recently confronting engineers of Seattle. The problem was solved by the use of open steel flooring on the bridge, as explained in the accompanying article by Robert C. Hill, special correspondent for STEEL in Seattle.

WHEN the city of Seattle decided to rebuild approaches to the University bridge in that city, because of obsolescence and the need for increased capacity, engineers were confronted with the difficult problem of widening the bascule spans. The original structure was not built with provision for greater weight or increased traffic, counterweights, machinery and the spans being delicately balanced. However, it was absolutely necessary to rebuild the bridge to accommodate the heavier traffic and avoid "bottlenecking" in the center of the structure.

Weight Saved, Strength Kept

Extended research by the city engineer's staff finally convinced them of the practicability of open steel flooring light in weight but yet of sufficient strength so that the saving in weight would overcome that of the steel required to widen the two spans. The bridge was decked with Irving-type V-special steel mesh decking, furnished by the Irving Iron Works, New York. This is said to be the first instance where this material has been used for bridge flooring and as far as local engineers know, also the first time where a bascule type bridge has been widened. J. A. Dunford, assistant city engineer in charge of bridge maintenance, is credited with developing the plan.

The original bascule, comprising two spans each 140 feet in length, had a 40-foot roadway with two 5--foot sidewalks on the outside. As rebuilt, the span has two additional 9-foot roadways on either side outside of the bridge trusses, with two 3-foot sidewalks on the outer edges. Double street car tracks are laid along the center. The work required about eleven months for completion.

University bridge is on one of the important arterial roads in Seattle. When the bridge was built about 16 years ago, it met traffic requirements which at the time totaled about 5000 automobiles per day. Now about 35,-000 automobiles cross this span each 24 hours and in addition the bridge carries heavy rail traffic.

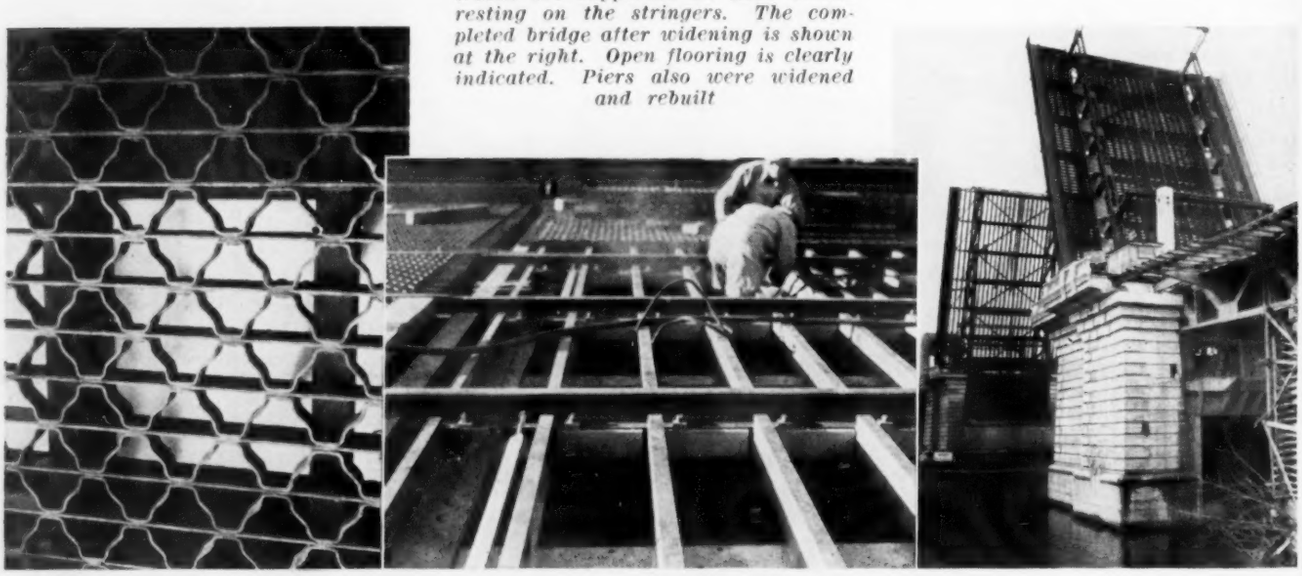
In addition to accommodating the heavy traffic, the bridge must be opened on an average of twice each 24 hours to allow the passage of ships. Its height, approximately 60 feet above water level, permits small vessels to pass without disturbing traffic. However, the engineering problem included the maintenance of speed in opening and closing the span under all conditions with the minimum of traffic interruption. Power is furnished by four 100-horsepower motors.

The special type steel decking replaced a treated wood block flooring, weighing 40 pounds per square foot. The steel weighs 22½ pounds per square foot, including 6-inch supporting channels. The mesh, shown in an accompanying illustration, is 2½ inches deep. The straight bars are 2½ x 3/16 inches, spaced 2½ inches apart. The bent or reticuline bars are 1½ x 3/16 inches in section and riveted to the straight bars with ⅜-inch rivets. The flooring is designed with a continuous splice making the grating a homogeneous whole.

Total Weight Slightly More

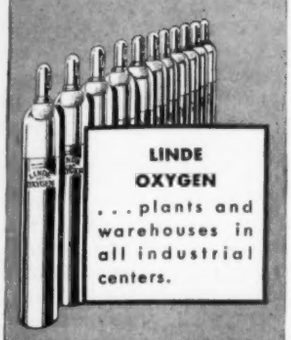
The saving in weight of the steel flooring offset the weight of the additional steel, confirming preliminary, calculations. The weight of the spans as rebuilt is slightly greater than originally but this has been compensated by adding to the counterbalances.

In rebuilding the sidewalk brackets were removed and about 50 tons of steel—brackets, stringers and fences —was added. The bascule piers had to be spread at the top to accommodate the increased width of roadway. Brackets and stringers for the two extra roadways were placed outside the bascule trusses. It was also necessary to demolish the oper-



RIVETED steel mesh decking (left) as it appears in closeup. After the old wood block and sub plank flooring was removed, 6-inch channel supports were laid crosswise to the original steel stringers (center), the mesh being placed over these supports. Car tracks are supported on wood blocks resting on the stringers. The completed bridge after widening is shown at the right. Open flooring is clearly indicated. Piers also were widened and rebuilt

EVERYTHING FOR
OXY-ACETYLENE
WELDING & CUTTING



LINDE OXYGEN
. . . plants and warehouses in all industrial centers.

PREST-O-LITE ACETYLENE
. . . the standard for well over a quarter of a century.

OXWELD APPARATUS AND SUPPLIES
. . . available for every oxy-acetylene welding and cutting operation.

UNION CARBIDE
. . . sold in the familiar Blue and Grey drum from over 250 warehouse stocks.

Bronze-Welding Increases Return on Maintenance Dollars

Power Plant Saves Dismantling

In a hydro-electric plant, ice broke out sections of the vanes of a turbine. Replacement, including dismantling, was estimated at $900. Repair by bronze-welding was done without dismantling and cost only $225. The unit was out of service less than 25 per cent of the time required for installation of new vanes. Case No. 3154**

Bronze-Welding Prevents a Shutdown

A sugar refinery depended on a single steam engine for primary power. The frame yoke cracked through the flange from the bottom upward along both sides and extending around two-thirds of the circumference. Replacement cost was $1,600 for a new yoke plus $900 for installation. A service operator advised bronze-welding without dismantling. Two welders, working simultaneously, completed the job in 8 hours. A shutdown was avoided. Case No. 2978**

Frame Bronze-Welded in Place

A brick-press frame developed a 36-in. fracture through 1¼-in. cast iron. Replacement would involve a special casting at $1000, delivery in three weeks. A service operator recommended repair by bronze-welding in place. The job was completed in four hours. The frame was then better able to withstand shock because the bronze weld metal was stronger and more elastic than the original casting. Case No. 4086**

Reciprocating Parts Rebuilt

A company operating a number of compressors, uses bronze-welding for maintaining efficiency. Thirty compressor cylinders have been resurfaced with bronze with an estimated saving of several thousands of dollars . . . . A marine company rebuilt four pistons by bronze-welding at a cost of $75 including machining. New pistons would have cost $350 . . . . Cost figures in a plant using bronze-welding for several years reveal an average cost of $20—including machining—for rebuilding pistons, against $45 for new pistons. Case No. 5273**

City Saves $1800

A 36-in. valve improperly installed in a city water main, cracked across the bonnet. The fracture extended 18 inches into the valve body. Bronze-welding the crack in place cost less than $200 and saved $1800 on replacement cost. Case No. 2701**

$2000 Casting Saved for $200

In a Middle Western plant, after $2000 had been spent in the manufacture of a pump casting a large bearing section was broken off. It was restored to full strength and alignment by bronze-welding for less than $200. The only preheating necessary was done with the blowpipe. Case No. 4195**

Oxweld No. 25 M. Bronze Rod

Increasing use of oxy-acetylene welding with bronze led to the development of Oxweld No. 25 M. Bronze Rod. This rod melts rapidly, flows freely, tins easily and solidifies quickly, combining speed with ease of application. It produces welds in steel plate with tensile strengths and ductility about 40 per cent higher than welds made with conventional bronze rods under similar conditions and the strength in shear is even greater. The hardness of welds made with this rod (96 Brinell) makes it especially useful for building up wearing surfaces. The weld metal can be remelted, permitting the same wearing surface to be rebuilt. A complete description of Oxweld No. 25 M. Bronze and other important Oxweld welding rods and fluxes is available in a new booklet, *Oxweld Welding Rod*, now available from any Linde District Office.†

New Literature

The Progress of Bronze-Welding and *The Principles of Bronze-Welding* fully explain correct practices for the application of bronze-welding and the great value of the process as a construction and repair method. These booklets are now available from any Linde District Office.†

**These typical savings may suggest a more aggressive use of bronze-welding in your plant. If you want additional details on these or other money saving applications of Oxwelding refer case numbers to the nearest Linde District Office.

†Copies on request. No obligation.

THE LINDE AIR PRODUCTS COMPANY
Unit of Union Carbide and Carbon Corporation
126 Producing Plants UCC 627 Warehouse Stocks
IN CANADA: DOMINION OXYGEN COMPANY, LTD., TORONTO

District Offices

Atlanta	Detroit	New York
Baltimore	El Paso	Philadelphia
Birmingham	Houston	Pittsburgh
Boston	Indianapolis	St. Louis
Buffalo	Kansas City	Salt Lake City
Chicago	Los Angeles	San Francisco
Cleveland	Milwaukee	Seattle
Denver	Minneapolis	Tulsa

LINDE OXYGEN • PREST-O-LITE ACETYLENE • OXWELD APPARATUS AND SUPPLIES • UNION CARBIDE

ating houses and rebuild them to meet the changed conditions of the roadway, the outer line of traffic now passing beneath the operator's house. The outer sidewalks were reduced in width as there is less pedestrian traffic then in earlier years. The Puget Sound Bridge & Dredging Co., Seattle, had the contract for widening the spans, steel for this part of the job being furnished by the Pacific Car & Foundry Co.

Traction Not Impaired

Tests have shown that the open steel flooring is not slippery and affords good traction. This is an important factor since previously in wet or frosty weather, accidents were numerous on the bridge. Due to slippery pavement or reckless driving, 182 vehicular mishaps occurred on the University span in 1931, six deaths resulting. Tests of the steel flooring were made under water, frost, grease and fresh paint conditions and in each instance the results were highly satisfactory. It is claimed the steel decking is not as hard on tires as a gravel road, there being no sharp edges or corners. No side skid developed during tests.

It is admitted that articles up to 1½ inches square will drop through the floor to the water below, but this is considered of slight importance. Sheep, cattle and hogs cannot be driven over the mesh deck but such animals are now all hauled in trucks. Horses, because of their natural timidity, cannot be driven across the open steel floor; however, since only eight horses are officially registered in Seattle, this objection is not serious.

In past years, accumulations of snow and ice have seriously interfered with the operation of the draw, increasing the weight beyond that of the counterbalances. No such trouble is expected in the future as snow will not collect on the decking. Wind pressure on a bascule is always an important item for which engineers have to provide additional strength and power. It is expected that the co-efficient for wind pressure may be materially reduced by the open type of flooring.

Maintenance costs of the mesh decking are unknown and can be determined only by experience. However, they are not expected to be heavy. Even should they be greater than heretofore, engineers state they will be offset by the reduction in accident hazard and increased safety for the general public.

To accommodate traffic, while the rebuilding was under way, the city constructed a narrow wood structure, paralleling the main structure, for both street cars and automobiles, at a cost of about $85,000.

Sound Steel with Inclusions Better Than Unsound Steel Without Any

BLAST furnace operation, steelmaking practice and gray iron and steel castings were major topics of discussion at the sixty-fourth annual meeting of the British Iron and Steel institute in London, May 4-5.

W. R. Lysaght, chairman, John Lysaght Ltd., Bristol, assumed the presidency of the institute, succeeding Sir Charles Wright. The first duty of the new president was presenting the Bessemer gold medal to Dr. W. H. Hatfield, director, Brown-Firth Research Laboratories, Sheffield.

This meeting was the occasion of the retirement of G. C. Lloyd, for 24 years secretary of the institute. On behalf of French members, Prof A. M. Portevin presented Mr. Lloyd with a gold watch. Prof. Portevin alluded to the valuable part which Mr. Lloyd had played in maintaining and developing the feeling of good will and friendship between French members and their British colleagues.

In a short address, Prof. Portevin, a past president of the Societe des Ingenieurs Civils de France, said that on that same day a ceremony was taking place in Paris to affix a tablet on the house where M. Fremont lived.

W. A. Haven, vice president, Arthur G. McKee & Co., Cleveland, was the author of a paper dealing with recent developments in American blast furnace design and practice. Discussing this paper, Prof. Henry Louis, past president of the institute, said that in referring to old-time operators, the author had not been quite fair to them because in the early years they had been obliged to use anthracite.

Gets in Word for Small Unit

S. H. Brooks said that the author had overemphasized the economy in production cost resulting from the operation of large units capable of producing 1000 tons per day, and that he had lost sight of the scientific achievements which have rendered possible the economic operation of smaller units as usually found in Great Britain and on the continent of Europe.

James Henderson, vice president of the institute, pointed out that pig iron is the basis upon which the steel industry rests and that in mechanical equipment and in furnace lines, British practice has made great steps forward, but that further improvements can be made in the preparation of raw materials. Arthur Crooke commented that after long periods of slow blowing, coke consumption increases when when blowing is increased.

Referring to a paper on inclusions in steel by Prof. Portevin and R. Perrin, Paris, Sir Robert Hadfield said he agreed with the authors when they said that knowledge of the nature of inclusions is of importance, first, for their influence on the properties of steel; and second, for the deductions which may be made concerning the processes of steelmaking.

Dangers Can Be Overstressed

Sir Robert asserted that in some cases too much stress is laid on the dangers of inclusions in steel; he prefers sound steel with some inclusions to unsound steels without any. Many defects, he concluded, are due to sulphur, especialy when the manganese is low, and he pointed out the beneficial influence of good pig iron, such as charcoal iron, which is very pure from the viewpoint of sulphur.

Dr. Walter Rosenhain said that several years ago people looked askance at the use of the term "slag inclusions," but the authors of the paper established the fact. He pointed out that the slag-metal equilibrium does not always show itself quickly, and sometimes not at all, owing to supersaturation. He also referred to the presence of gas inclusions in steel, which does determine the form of inclusions. He confirmed the views of other speakers in stating that if inclusions are evenly and finely distributed, they are not dangerous.

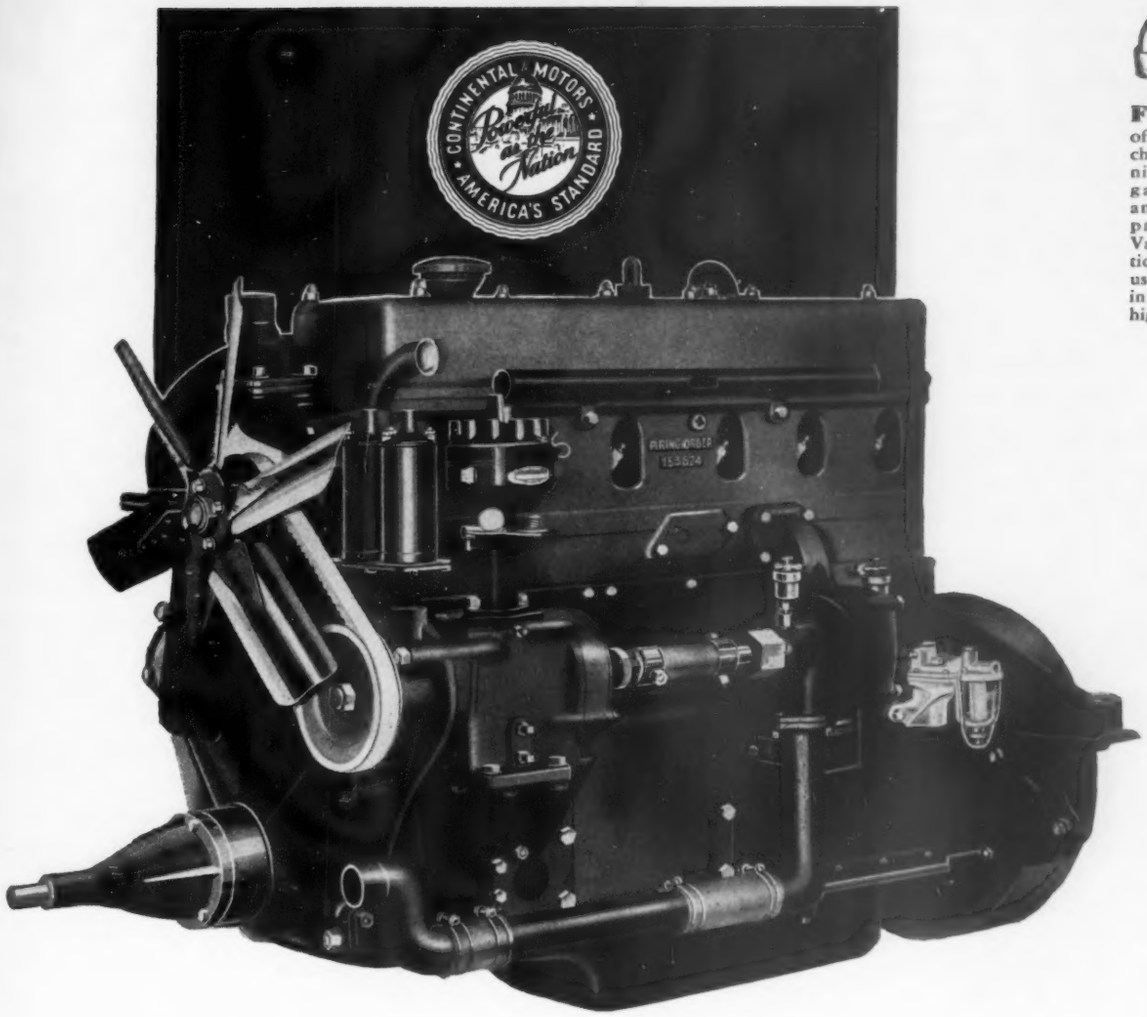
A.S.T.M. Aligns Meeting Program

THE American Society for Testing Materials has just announced the provisional program for its thirty-sixth annual meeting to be held at the Stevens hotel, Chicago, June 26-30.

By deviating somewhat from its customary schedule, the society devotes its open session to a symposium on cast iron arranged jointly with the American Foundrymen's association. All of Wednesday is left open to permit members to participate in the Engineers Day program of the Century of Progress exposition.

An exhibit of testing apparatus and equipment, similar to the one held two years ago, will be conducted in the exhibit hall of the hotel.

A feature of the meeting program will be the Edgar Marburg lecture to be presented on Tuesday afternoon by Dr. H. J. Gough, National Physical Laboratory, England, the subject being



Ferro-Alloys
of vanadium, silicon, chromium and titanium; silico-manganese, tungsten and molybdenum, produced by the Vanadium Corporation of America, are used by steel makers in the production of high-quality steels.

IN *Continental Red Seal Motors*

for heavy duty truck and bus service, crankshafts are made of Chrome-Vanadium Steel. It was selected by Continental's Engineers because of its high strength, wear hardness and resistance to fatigue. Service has amply demonstrated the wisdom of the choice. > > > > >

Vanadium Corporation of America, *New York, N.Y., Pittsburgh (Bridgeville) Pa., Detroit, Mich., Niagara Falls, N.Y.*

If you are interested in steels that must provide the utmost dependability without the penalty of prohibitive price or added production difficulties, use Vanadium Steels. Our Metallurgists can aid you. Write us today.

Vanadium Steels

FOR STRENGTH, TOUGHNESS AND DURABILITY

"Crystalline Structure in Relation to Failure of Metals Especially by Fatigue."

At the annual meeting on Monday evening, the Charles B. Dudley medal for 1933 will be awarded to Samuel Epstein, metallurgist, Battelle Memorial institute, Columbus, O., for the outstanding paper presented at the 1932 annual meeting. Mr. Epstein's paper was "A Study of the Embrittlement of Hot Galvanized Structural Steel."

Standing and special committees will submit reports at various sessions, but in addition to these a number of technical papers are scheduled as follows:

Monday, June 26

MORNING

Symposium on cast iron—A joint session with American Foundrymen's association.

AFTERNOON

Cast Iron, Effect of Temperature on Metals

"Creep and Structural Stability of Nickel-Chromium-Iron Alloys at 1600 Degrees Fahr.," by W. A. Tucker and S. E. Sinclair, bureau of standards.

"Studies on Creep of Metals Using a Modified Rohn Test," by C. R. Austin, Westinghouse Electric & Mfg. Co.

EVENING

Annual Meeting

Presidential address by Cloyd M. Chapman.

Award of Dudley medal.

Tuesday, June 27

MORNING

Steel and Wrought Iron

"Shearing Properties and Poisson's Ratio of Structural and Alloy Steels," by Inge Lyse and H. J. Godfrey, Lehigh university.

"The Torsion Impact Test," by G. V. Luerssen and O. V. Greene, Carpenter Steel Co.

AFTERNOON

Marburg Lecture

"Crystalline Structure in Relation to Failure of Metals Especially by Fatigue," by Dr. Herbert J. Gough, superintendent of engineering department, National Physical Laboratory, England.

Thursday, June 29

MORNING

Fatigue of Metals, Testing and Metallography

"Fatigue Testing in Tension of Galvanized Wire; Effect of Initial Tensile Stress," by S. M. Shelton and W. H. Swanger, bureau of standards.

"The Fatigue Properties of Light Metals and Alloys," by R. L. Templin, Aluminum Co. of America.

"An 'Overnight' Test for Determining Endurance Limit," by H. F. Moore and H. B. Wishart, University of Illinois.

"Relative Merits of Film and Paper for Industrial X-Ray Work," by Ancel St. John and H. R. Isenburger, St. John X-Ray Service Corp.

AFTERNOON

Corrosion of Metals

"Consistent Data Showing the Influence of Water Velocity and Time on the Corrosion of Iron," by R. F. Passano and F. R. Nagley, American Rolling Mill Co.

"Corrosion Resistance of Structural Aluminum," by E. H. Dix Jr., Aluminum Co. of America.

Chicago Power Show Moved To Stevens Hotel

The Sixth Midwest Engineering and Power exposition to be held in Chicago, June 25-30, and previously scheduled for the Coliseum will be transferred to the Exhibition hall of the Stevens hotel, the center of Engineering Week activities of the Century of Progress exposition.

This change in location, it is said, will permit the engineering professions to visit the show while attending their meetings and brings together the Engineers' Day banquet on June 28 and the exhibit in the same building. Nineteen engineering associations have approved participation in activities of the week.

1933 Standards Yearbook Lists 31 New Projects

To what extent the efforts of American industries toward self-regulation have been successful is shown tellingly in the 1932-33 edition of the *American Standards Year Book*, recently issued by the American Standards association, 29 West Thirty-ninth street, New York.

The establishment during the past 12 months of 31 new national industrial standards, affecting nearly every major industry, is recorded, as well as the co-operative achievement of nearly 3000 scientists and engineers representing more than 500 national technical and trade organizations in the development of a unified system of basic technical standards.

This 44-page summary of present status of the standardization movement is available upon request to the association.

Announces X-Ray Paper for Industrial Applications

St. John X-Ray Service Corp., 505 Fifth avenue, New York, announces an X-ray paper which may be used in industrial work in place of the customary film.

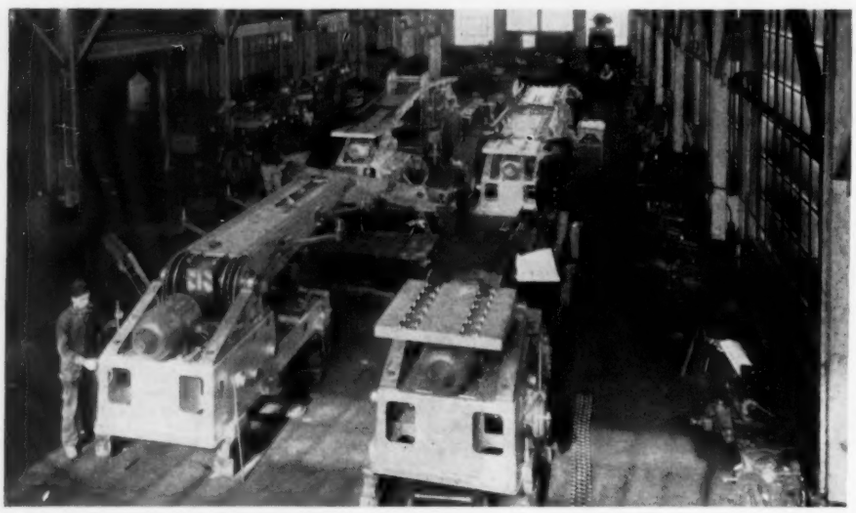
According to the announcement, this paper is less than half the price of film, is easy to handle, dries rapidly, requires only one intensifying screen instead of a pair, and yet is as fast as film and gives much contrast. The 2 per cent marker is readily recognizable. Two sheets are exposed simultaneously in one cassette, this having the advantage that one negative can be retained while the other goes along with the material. Developing time for the paper is 3 minutes at 68 degrees Fahr. when using St. John special chemicals.

It is stated that anything which can be examined with film can be examined with the paper.

Phosphor Bronze Bars Are 13 Inches in Length

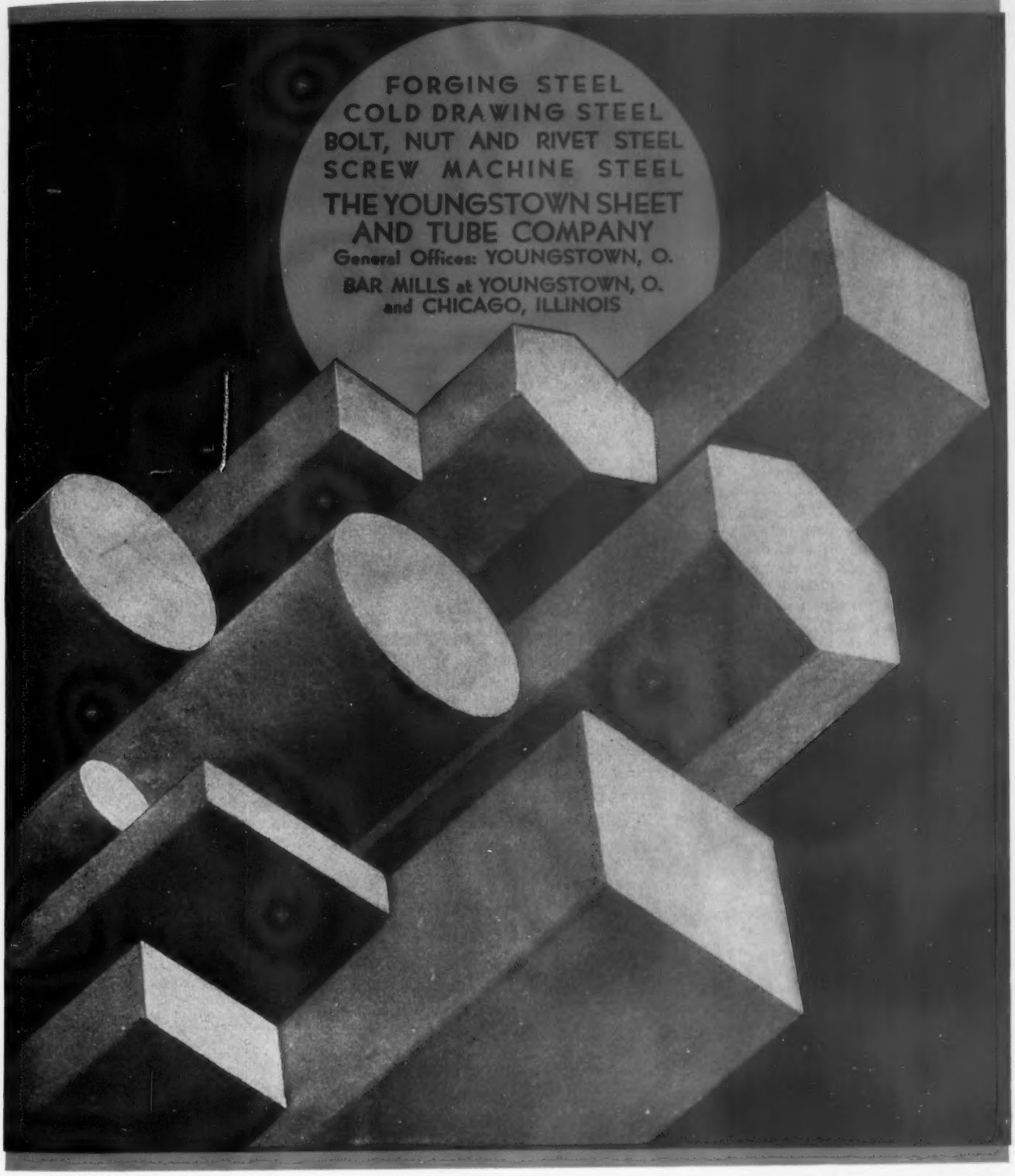
In connection with the announcement, on page 34 of the May 1 issue of STEEL, of machined and centered phosphor bronze bars recently placed on the market by the Bunting Brass & Bronze Co., Toledo, O., it should have been stated that the new bars are supplied in lengths of 13 inches.

The 13-inch bars allow the machinist to obtain multiples of standard bushing lengths, such as 1½, 2, 3, 4 and 6 inches, which cannot be done with the customary 12-inch bar due to length loss in the cutting-off operation.



SILENCE NO LONGER RULES IN THIS MACHINE SHOP: Finishing department of the McKay Machine Co., Youngstown, O., showing hot sheet mill feeder and catcher tables being assembled and tested prior to shipment to a sheet manufacturer in this country. Equipment such as this has aided materially in stepping up production of conventional-type hot sheet and tin mills and lowering the labor cost associated with the hot rolling of flat stock

YOUNGSTOWN



HOT ROLLED BARS

IMPROVING OPEN-HEARTH FURNACE DESIGN

BY WILLIAM C. BUELL JR

Part V—Open-Hearth Furnace Lines

(Thirty-Third Article of Series)

IN THE solution of various velocities by this method, no cognizance is taken of the effect of surface friction which may be appreciable in small ducts, such as uptakes and ports but small in the furnace proper. To consider the effect of this factor would greatly complicate the solutions and when the figures are used as comparative data it is not thought any particular purpose would be served by the inclusion of an added calculation to compensate for friction loss. Consequently, the calculation is omitted.

Presentation of a comprehensive explanation of the method of computing the velocity flow through the furnace is difficult in view of the necessity of arranging combinations of areas at the furnace ends; of fuel and air at the incoming end; and, waste gas at the outgoing end, without developing a complete calculation for a furnace. This accordingly will be the method of description followed and furnace A is the unit chosen for this demonstration.

As shown in Table LIX, the volumes in cubic feet at 32 degrees Fahr. of the gases flowing per second are 158.3, 174.0 and 332.3 for the producer gas, the air and the waste gas, respectively.

Details Are Tabulated

The details of the areas from Table LIII, the appropriate temperatures of Table LVII, and the corresponding specific velocity values from column D, Table LVIII are arranged conveniently for incoming and outgoing effect in Table LX.

The relative velocities at the critical areas now are developed from end to end of the furnace in accordance with the following detailed calculations employing equation No. 23 for the solution.

The air enters the furnace throat from the uptakes at A_8 and the velocity at this vicinity will be:
174.0 × 2.15/18.00 or 20.8 feet per second.

In entering the throat, owing to the greater area at A_5, the air expands and the velocity drops:
174.0 × 2.15/73.80 or to 5.1 feet per second.

This assumes that the air expands to completely fill the furnace end. On account of its dynamic head and streamline flow the assumption is not exactly correct. It is however, the only basis upon which it is possible to premise such a calculation.

Area Is Constricted

There is a constriction of area immediately over the gas nozzle at A_4. Consequently an increase of air velocity is encountered in this locality. The new velocity will be:
174 × 2.15/43.90 or 8.5 feet per second.

At this vicinity the fuel meets the air, combustion is initiated and the two fluids continue as furnace gas or the products of combustion and the gaseous products of the bath.

How Velocity Is Determined

Producer gas fuel enters the fuel port at A_7 which is assumed to maintain the same area and consequently the same velocity to the nozzle. The gas velocity at the termination of the uptake and through the port is therefore:
158.3 × 2.24/10.5 or 33.8 feet per second.

The nozzle A_3 being of less area than A, causes an increase of velocity to:
158.3 × 2.24/5.28 or 67.2 feet per second.

Here the gas meets the air and at the incoming knuckle A_2 the fluid is considered as furnace gas. The velocity at A_2 will be:
332.3 × 2.71/45.16 or 19.5 feet per second.

The furnace gases now flow over the bath developing first the maximum temperature and then decreasing in temperature and velocity. However, a mean velocity based on an average temperature is found as:
332.3 × 2.76/104.65 or 8.75 feet per second.

Approaching the outgoing knuckle having a lesser area A_2 the velocity is increased to:
332.3 × 2.69/45.16 or 19.0 feet per second.

After passing the knuckle the combined area of $A_2 + A_4$ is presented for the entry of the furnace gases into the downtake ducts. These combined areas produce an average velocity of:
332.3 × 2.67/ (43.90 + 5.28) or 18.0 feet per second.

The velocity of the furnace gases reaching the outgoing end are influenced by the combined areas $A_5 + A_7$ as follows:
332.2 × 2.67 / (73.80 + 10.50) or 10.4 feet per second.

The furnace gases finally enter the combined downtakes A_8 with an increase of velocity per second to:
332.3 × 2.65 / 23.28 or 37.8 feet.

Table LIX

Fluid Flow in Open-Hearths

Furnace	Fuel factor *F*	Flow volume*, cu. ft./sec. Fuel	Air	Furnace gas
A	0.0281	211.0	232.0	443.0
B	0.0197	.....	173.0	192.0
C	0.0204	34.7	179.0	199.0
D	0.0189	35.9	161.5	179.5
E	0.0234	.....	205.8	228.5
G	0.0217	91.1	200.0	288.5
H	0.0215	.....	188.7	209.6
I	0.0307	.....	268.5	298.3
J	0.0257	183.0	201.3	384.3
K	0.0244	192.8	212.0	404.8
L	0.0273	107.5	235.0	341.0
M	0.0260	49.4	222.1	247.0
N	0.0340	255.0	280.0	535.0
O	0.0370	278.0	310.0	583.0
P	0.0267	50.6	228.0	253.0

*Volumes quoted are as at 32 degrees Fahr. and 30 inches mercury.

Table LX

Data for Calculating Velocity Flow in Furnace A

Section	Area, feet	Incoming Fluid*	Incoming Temperature, degree Fahr.	Incoming *K*	Outgoing Fluid*	Outgoing Temperature, degree Fahr.	Outgoing *K*
A_1	104.65	FG	3280	2.76	....	....	....
A_2	45.16	FG	3150	2.71	FG	3100	2.69
A_3	5.28	F	2000	2.24	FG	3050	2.67
A_4	43.90	A	1800	2.15	FG	3050	2.67
A_5	73.80	A	1800	2.15	FG	3050	2.67
A_6	18.00	A	1800	2.15	FG	3050	2.67
A_7	10.50	F	2000	2.24	FG	3050	2.67
A_8	23.28	....	....	....	FG	3000	2.65

*FG = Furnace gas, F = Fuel, A = Air.

The foregoing method may be abridged or amplified as may seem desirable but the figures as developed will meet most requirements. Calculations for certain locations often will be redundant as when the throat is fairly regularly developed from A_7 to A_5.

Values Are Comparable

The chief value of the method described lies in the fact that the figures actually show gas velocities at various points in a furnace, corrected to a base temperature (32 degrees Fahr.) or the volume of fluids flowing through a unit area (1 square foot) per second. Under this method the values directly are comparable with the values of any other furnace, regardless of size, that have been calculated in the same manner. Thus, the strength of one furnace and the weakness of another may be established.

A second important use for these figures is their employment in the development of flow diagrams to be discussed later, and by which furnace operation may be delineated graphically.

For the purpose of developing comparative velocity figures in the several furnaces under examination the unit velocity values are computed in accordance with the method previously described and are listed in Table LXI.

As used in the following comments the term pressure may be designated as above or below that of the atmosphere. In open-hearth furnace operation on account of thermal effect or mechanical draft, the pressure of the air in the incoming throat of the furnace is above that of the atmosphere. Fuel that has been regenerated enters the throat and flows therethrough under some positive pressure whereas driven fuels, which are end fired, enter the throat and flow into the combustion zone under a considerable dynamic head.

Requires Induced Draft

Most furnaces in use at present are equipped with a waste-heat boiler installation, or a system such as the Isley is used, requiring the service of induced draft (suction) equipment. The exhausting effect of this equipment usually is apparent in the outgoing throat and develops a subatmospheric pressure of a greater or lesser degree. With pressure at the incoming end and suction at the outgoing end there must be a region or point of zero pressure between the two. This region should be over the bath in order that the furnace may be balanced properly.

The gaseous velocities of open-hearth furnace practice may be translated into terms of pressure by means of a graph, Fig. 46.

The values of velocity offered obviously will represent those resulting from dynamic or moving head. The figures of pressure or suction herein developed are those that, when static, will produce the corresponding velocity if flowing to or exhausting from the atmosphere under a static head of appropriate value.

Table LXI

Unit Fluid Velocities Through Critical Furnace Areas

	UPTAKES AND THROAT					HEARTH			THROAT AND DOWNTAKES		
	Air			Fuel		Furnace Gas					
FURNACE	A_6	A_5	A_4	A_7	A_3	A_2	A_1	A_8	A_8+A_4	A_5+A_7	A_6
A	27.8	6.8	11.4	45.0	89.5	27.2	11.7	26.5	24.1	13.9	50.5
B	6.7	6.6	4.8	....	....	8.1	4.7	8.0	6.1	8.4	8.5
C	12.6	....	....	....	28.4*	....	3.5	10.9	....	11.7	15.6
D	9.1	3.2	....	....	....	8.2	5.1	8.1	....	4.1	11.5
E	8.5	5.7	....	....	....	9.1	6.0	8.9	....	7.3	10.7
G	10.3	....	22.2†	40.7†	31.9†	10.8	8.1	10.8	15.8	7.8	18.5
H	7.8	6.2	9.3	....	....	12.1	5.8	11.9	11.8	7.9	9.8
I	9.8	8.1	....	....	....	14.0	8.1	13.8	....	10.3	12.4
J	6.7	3.7	7.5	30.8	93.0	21.9	9.1	21.8	16.6	7.9	14.7
K	9.9	6.6	5.8	59.5	82.9	18.8	8.5	18.6	12.9	14.1	20.0
L	13.4	7.4	8.6	14.4	69.2	16.8	8.9	16.7	14.3	12.3	16.7
M	8.9	6.7	7.9	....	....	12.6	5.6	12.4	10.0	8.5	11.2
N	17.8	7.7	14.5	47.5	92.5	26.5	11.9	26.3	29.6	15.6	35.1
O	15.8	7.8	10.9	47.5	92.6	27.8	10.4	27.6	22.9	15.1	31.4
P	7.8	4.1	7.5	....	....	17.2	6.0	16.9	9.4	5.2	9.8

*Combined air and fuel, which enter the furnace at four points, are represented in this figure.
†Air enters the throat through a port similar to a gas port in this particular type of furnace.

Affects Pressure Condition

Bearing in mind the law that to double the velocity (or volume) flowing through a given area the pressure must be increased by four, it will be evident that a small change in velocity may affect the pressure condition considerably. From a casual examination of Table LXI and omitting reference to fuel velocities it might be assumed that air and furnace gas velocities that do not exceed 12 to 15 feet per second are found to give satisfactory results.

The pressure resultant from a 15-foot velocity, as shown in Fig. 45, is 0.055-inch of water. If the velocity required to void the waste gases is increased to 37.8 feet per second because the downtakes are of insufficient area, as at A_5 Furnace A, the pressure (suction) in this case would be 0.32-inch of water. This value is large in this practice and is nearly six times as great as with the 15-foot velocity.

The example incidentally indicates the value of this type of calculation for prophecy or check of furnace operation, or for the diagnosis of its ills. The use of this method of calculation and analysis generally should be accepted.

(To be Continued)

Welding Courses Popular

Completion of the recent one-week condensed welding course given in Cleveland by the John Huntington Polytechnic institute and the Lincoln Electric Co. was marked by the largest attendance of any of the four similar courses given during the winter. Included in the registration were men from Germany, Japan and Sweden as well as from ten different states. The success of these one-week courses in designing for welding has led to the decision to repeat the courses in the fall.

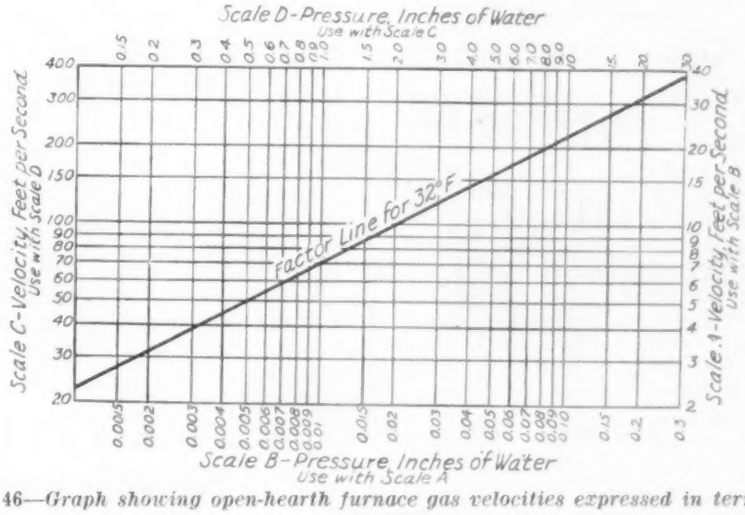
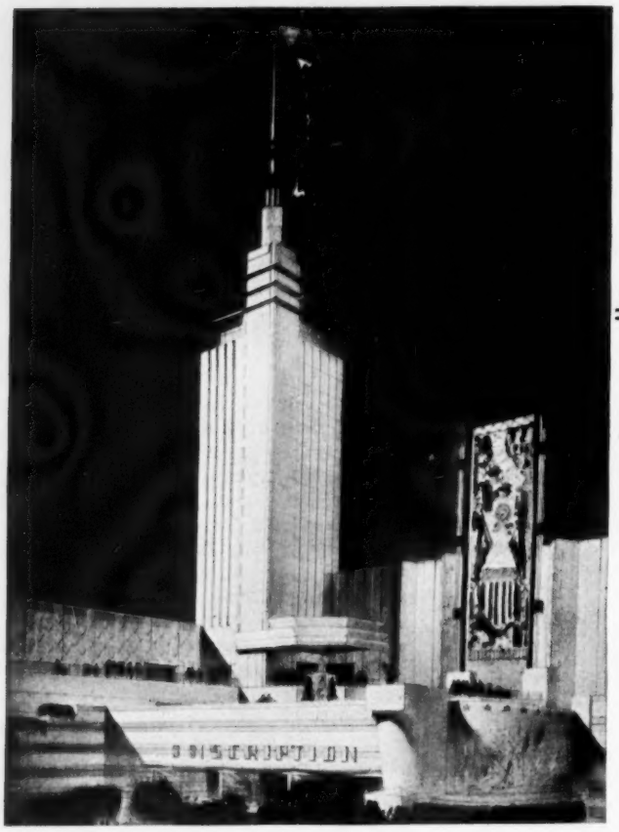

Scale D-Pressure, Inches of Water
Use with Scale C
Scale C-Velocity, Feet per Second
Use with Scale D
Factor Line for 32° F
Scale A-Velocity, Feet per Second
Use with Scale B
Scale B-Pressure, Inches of Water
Use with Scale A

Fig. 46—Graph showing open-hearth furnace gas velocities expressed in terms of pressure

This is the WEEK



YOU SHOULD ATTEND THE FAIR!

and the

Industrial Marketing Conference!

Engineering Week
June 26-28

You're coming to the Fair of course!

Then come when you can enjoy these many business, educational and pleasure events *all in one week*. The Industrial Marketing Conference, Engineering Week — National Conventions of 19 technical societies, the Mid-West Power Show and the World's Fair, A Century of Progress.

The Century of Progress Industrial Marketing Conference, the eleventh annual convention of the National Industrial Advertisers Association, will treat the significant phases of the most important problem before industry today—increasing sales during a depression and a recovery.

Nationally prominent industrial executives worth hearing because of their success since 1930 will discuss market analysis, distribution, managing salesmen, sales promotion and advertising. There will be departmental meetings, clinical discussions of sales and advertising programs, panel displays and commercial exhibits.

The conference will be held at the perfectly appointed Medinah Athletic Club where you may enjoy the swimming pool, bowling, billiards, shooting gallery and other attractions. June 26 to 28. Don't miss it! Plan now! Write for details.

TIE THESE TOGETHER
IN ONE BIG WEEK—

National Marketing Conference
Engineering Week
Midwest Power Show
Century of Progress
Chicago, the Summer Resort

JUNE 26-28

NATIONAL INDUSTRIAL ADVERTISERS ASSOCIATION

National Headquarters — 537 S. Dearborn St.
CHICAGO

Making the Most of

METHODS AND MATERIALS

PLANTS which have not properly cared for idle machinery during long shutdown periods frequently find some of the equipment incapable of operation without repairs and overhauling. As an example, a western farm implement manufacturer had permitted a large turret lathe to stand out in the open for a couple of years. To protect it from the elements, the tool had been lubricated and slushed with oil and grease. At the end of this period, the lathe was needed in production and it was moved into the shop. The manufacturer of the machine had been requested to have a service representative on hand to make an inspection before the unit was started. The examination revealed many parts unserviceable with the result that three days were spent in taking parts from other idle machines to place the lathe in running order.

$ $ $

Substantial economies are reported by an eastern oil refinery as a result of adoption of nickel-chromium cast iron for piston rings. Rings produced from a suitable base mixture containing 1.50 per cent nickel and 0.45 per cent chromium have lasted 13 months, as compared with 6 weeks for conventional gray cast iron. To the saving of material, labor and pump service provided by the extended life of the rings is added the cost of approximately 1300 gallons of gasoline normally lost during this period by leakage.

$ $ $

AUTOMOBILE manufacturers are realizing the necessity for rustproof protection for practically every part of the chassis and body which, due to location in the car, would be subject to corrosion. In some cases, parts not particularly subject to corrosion have been so protected for the purpose of improving their appearance. A check up of one 1933 car shows 44 parts are rustproofed; some of the more important parts given the treatment are fenders, running board housings, hoods, radiator shells and grilles and tire covers. The 44 parts have an area of 220 square feet per car.

$ $ $

A manufacturer of electric motors has perfected a line of sound-absorbing bases which are so proportioned mechanically and the special grade of insulating material is under such an initial stress as to absorb all six possible modes of vibration of such frequencies as may be expected from the particular motor for which each base is designed. The proportions are first calculated and then checked by test on sample bases. The bases include a sliding feature for belt adjustment and are for use only with

multiple V-belt drive on induction motors from ½ to 50 horsepower. While designed primarily for motors driving ventilating fans and belt-driven pumps, they can be used wherever a multiple V-belt drive is used on induction motors within the horsepower range. They also permit a speed reduction on the motor to 70 per cent by suitable control, and insulate against such frequencies as may occur within this speed range.

$ $ $

A German development, known as migra or micrographitic pig iron is attracting attention in Europe. This product, which sells at $2 to $3 a ton over the standard foundry grades, involves a supplementary heating process by which the molten iron from the blast furnace is placed in a fuel-fired rotary furnace and the temperature is increased. The manufacturers recommend the use of from 20 to 25 per cent of the migra iron in the cupola mix and claim a 15 per cent increase in physical properties. The migra iron is made in both high and low carbon and high and low silicon ranges. The superiority claimed is based upon finely divided graphite structure.

$ $ $

Development of a new metallic arc welding rod for welding high nickel alloys has been announced. This rod is said to be a definite improvement over that which has been in use for three years and makes easier the joining and welding of such alloys as chrome-nickel, monel metal and nickel-clad steel.

$ $ $

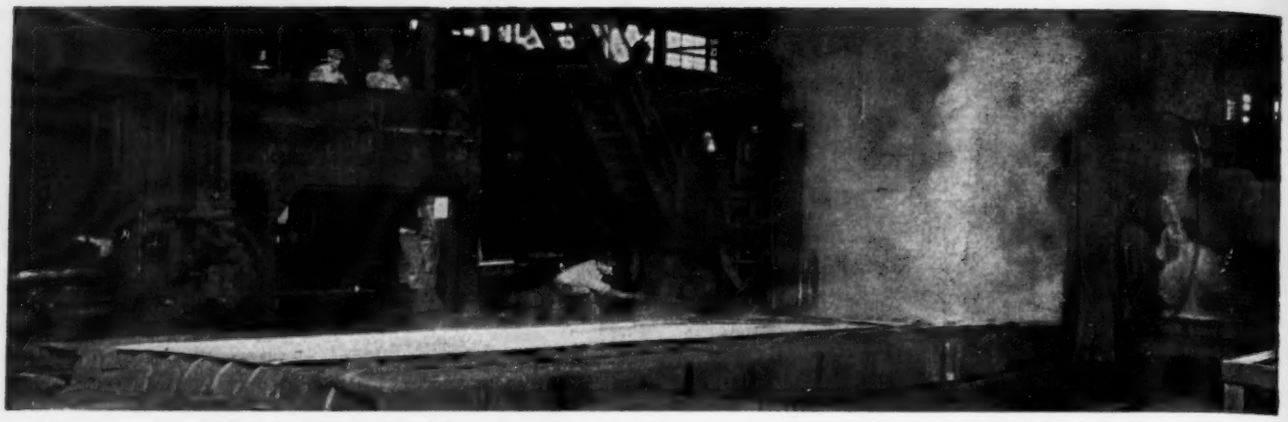
CADMIUM-PLATED surfaces solder readily. Investigation and subsequent application to production work has established that the cadmium finish will fulfill all the functions of tin coating without any drawback, either in relation to quality of the soldering, in manipulation, labor costs, or solder consumption. Because solder flows freely on plated cadmium independent of the base upon which deposited, ferrous or nonferrous metals may be plated preparatory to soldering.

$ $ $

Operating at 400 surface feet per minute, a tantalum carbide tool in one cut ⅛-inch deep machines a phosphor bronze bar to a mirror-like finish in 44.5 per cent less time than the tool used formerly.

$ $ $

An Ohio welding company recently repaired the broken frame of a stamping press by arc welding and thereby effected a substantial saving for the customer. The job had to be done with the utmost precision inasmuch as the frame carried the guide and other mechanism which determined the accuracy of the operation of the press. A new frame for this machine would have cost in the neighborhood of $300 while the total cost of repairing the old frame by welding was but little more than one-quarter of that sum. Seventy-five pounds of ¼-inch welding electrode was used on the job. Since its repair, the press has resumed regular operation.



PROGRESS IN STEELMAKING

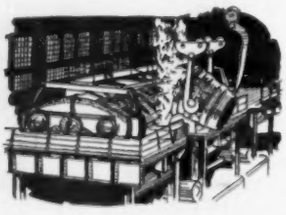
CLEANING seamless pipe by subjecting it to a blast composed of sand and carborundum is being accomplished experimentally by a Pennsylvania producer of tubular products. This method has been found both quicker and some 75 per cent cheaper than the pickling operation to remove scale. Both the interior and exterior walls of the pierced tube are subjected to the sand blast operation. Thus far its only limitation has been in longer lengths of pipe.

♦ ♦ ♦

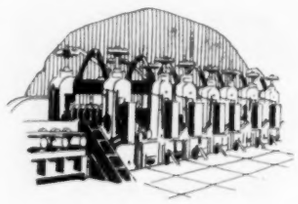
New applications for the thrustor, a device for producing a straight-line motion, include the operation of the loopers on a 14-inch hot strip mill, thereby eliminating the need for high-pressure hydraulic system.

♦ ♦ ♦

Hard facing material in the form of rods has been marketed for application either by gas or electric welding. One grade of rod with a high crystal content in a matrix of iron, nickel and molybdenum, is designed for treating shovels, coke chute linings, elevator buckets, etc. The product also affords an extremely hard and abrasive resisting overlay when applied with a carbon arc to the surface of shear blades, gag press hammers, pinch cams and other steel parts to a depth of about ⅛-inch and fused.



COUNTERWEIGHTING a steelworks mixer has been accomplished in a novel manner. The counterweight is hoisted by a 25-horsepower motor, the hoist mechanism being connected to the main drive of the mixer through gears of the planetary type. When the vessel is to be tilted the counterweight hoist motor is actuated until the weight is in its uppermost position which permits the tilt motion of the mixer to be operated in either direction of travel. In case of mixer overtravel, power failure, or operation of the dead man switch, a spring open brake is released which causes the counterweight to descend and thus bring the mixer to its upright position. When the counterweight comes to rest, the mechanical strain to which the mixer is subjected, is cushioned by dynamic braking.



COEFFICIENTS of bearing friction in mills designed to roll billets and sheet bars and in merchant and rod mill roughing stands have been measured by a rolling mill builder and found to vary between 5 and 20 per cent.

♦ ♦ ♦

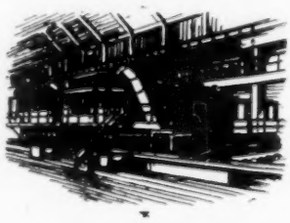
Surface temperatures of billets in transit through a rail mill now are recorded accurately in any pass by the use of a quick-responding, fixed focus, radiation pyrometer and a thyratron recorder. The instrument is sighted on the hot surface in such a way that the radiant energy does not have to pass through a cloud of steam or dust before reaching the radiation pyrometer. Where a clear vision of the hot surface is obtained during a time interval of 2½ seconds, the actual temperature of the surface is recorded. The instrument is calibrated to measure temperatures under black body conditions, but provision is made on the recorder to make a permanent correction for the emissivity of the hot surface under operating conditions. Thus when used to measure the temperatures of rails in the rail mill, it is possible to make correction for the working conditions and thus record true surface conditions. The instrument has been used on sheet, rod and wire mills. The recorder is a continuous line chart. Ranges from 1000 to 2200 degrees and from 1300 to 3000 degrees Fahr. are covered by the previously mentioned chart.

♦ ♦ ♦

Chamfering nonmetallic rolling mill bearings at the lubricating entrance, prevents the water and scale from washing away the grease and extends the life of the bearing from two to three times.

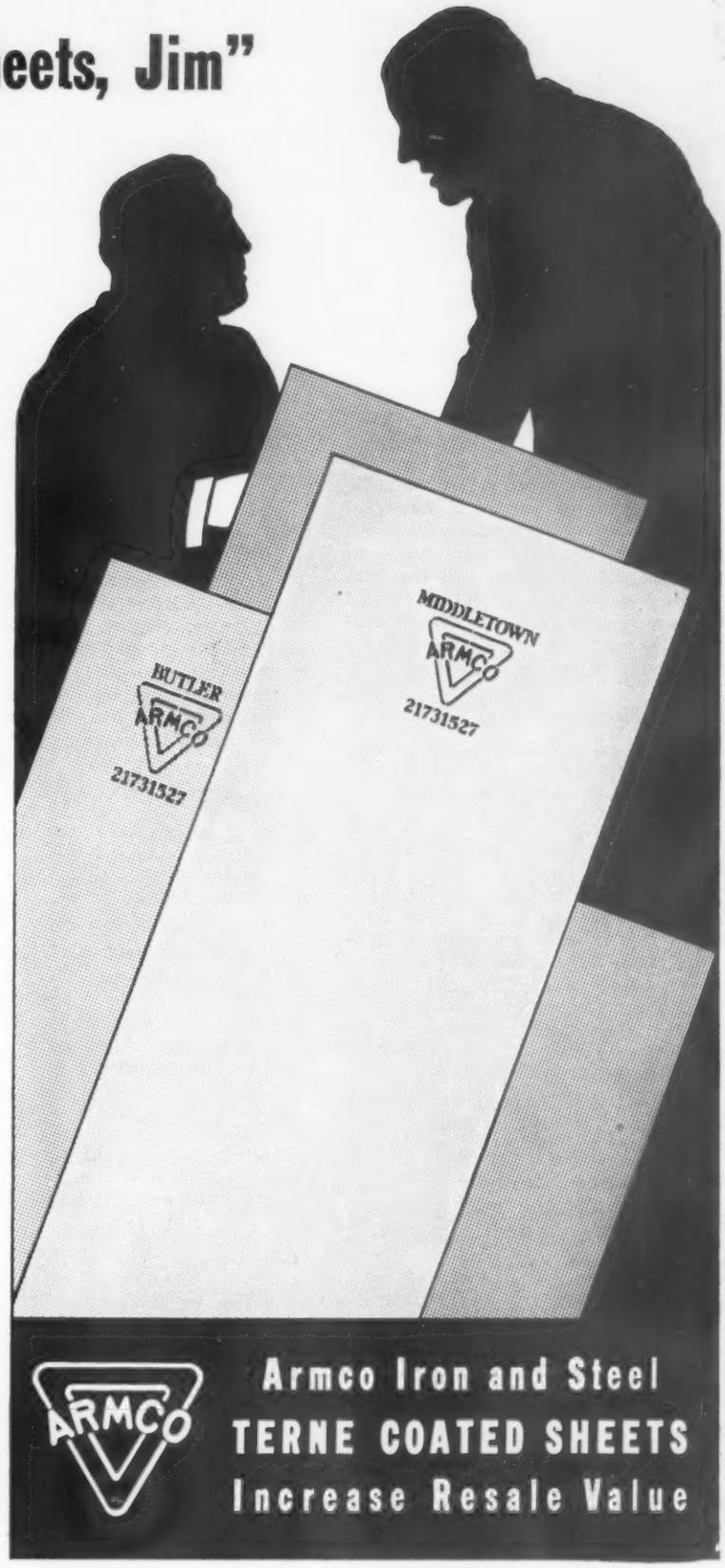
♦ ♦ ♦

Brazing high-speed metal cutting tips of steel shanks containing from 0.50 to 0.63 per cent carbon, 0.15 per cent minimum silicon, 0.60 to 0.90 per cent manganese and 0.04 per cent maximum phosphorus is simplified by the use of a brazing compound containing 12 per cent borax, 20 per cent of 50 per cent ferrosilicon and 68 per cent of 80 per cent ferromanganese. Mixed with this compound is 25 per cent by weight of high-speed steel filings.



DIFFICULTY in lubrication of bearings with oil on a roll table at the discharge end of a slab heating furnace has been eliminated by the installation of nonmetallic bearings lubricated with water.

"... good stuff in these sheets, Jim"



SOMEBODY overheard that comment on Armco INGOT IRON long terne sheets and passed it on to us. Naturally it made us feel good, because it is what we have tried persistently to give our customers for many years.

Yes, there is "good stuff in these sheets" . . . good, uniform iron accurately rolled to gage; and of just the right temper to work freely and keep down fabricating costs. Then we add the required special coating and check it carefully for weight, smoothness, adherence, and surface perfection. Whether you order INGOT IRON or Steel terne-coated sheets, you can look for definite improvement in the finished product.

One of the industries that has profited through the use of Armco terne-coated sheets is the casket industry. Here the majority of manufacturers use Armco INGOT IRON exclusively, so advantageous is its forming qualities and fine finish.

Could we help you gain dollar-savings and resale profits through the use of Armco Iron and Steel Sheets? A representative from our nearest office will be glad to study your requirements. Invite him in.

THE AMERICAN ROLLING MILL CO.

Executive Offices: Middletown, Ohio

DISTRICT OFFICES: *Boston . Chicago Cleveland . Detroit . Middletown New York · Philadelphia . Pittsburgh St. Louis . San Francisco*

PIONEERS IN CONTINUOUS SHEET ROLLING

SCANNING THE FIELD OF TECHNOLOGY

A Digest of Important Developments Pertaining to the Production, Processing, Application and Performance of Steel

Valve Failures

By C. C. Hodgson, a paper presented at the May 5 meeting of the Iron and Steel institute (England) in London, preprinted, 15 pp., 22 ills., 2 tables.

Common types of failure of internal combustion engine exhaust valves are explained. Breakages are considered to be the result of corrosion-fatigue. Burning and cracking of the valves at their edges appear to be caused initially by small leakages of hot gases. The best steels so far developed are said to be incapable of meeting the severe demands for this service. To meet the requirements of an ideal valve, combining resistance of the seat to burning, high strength and scale resistance in the neck, and the best wearing conditions for the stem and tip, would require a three-piece construction, or two-piece construction and selective surface hardening.

—STEEL, 5-22-33

Large Forgings

A paper by E. Maurer and H. Korohan, published in Stahl und Eisen (Germany), March 2, 9 and 16.

Systematic and detailed research into the properties obtainable in large forgings, with special reference to mass effect. Forgings studied were selected as representative of the largest in current supply, and their properties were determined as a function of variables regularly present in metallurgical practice—alloy content, degree of forging and heat treatment. Steels studied were: 0.2 per cent carbon steel; 1.2 per cent manganese steel; 2 per cent nickel steel; and nickel-chromium-molybdenum steel.

—STEEL, 5-22-33

Transformer Steel

By R. F. Edgar, a paper presented at the northeastern district meeting of the American Institute of Electrical Engineers in Schenectady, N. Y. May 10-12; preprinted, 5 pp., 11 ills.

Study of core loss characteristics of silicon steel at 60 cycles with direct-current excitation. Silicon contents of the sheet samples tested were approximately 2½, 3¼ and 4 per cent. Test results are presented graphically.

—STEEL, 5-22-33

Electric Furnaces

By H. M. Webber, in Metal Progress, May, p. 34, 4 pp., 3 ills.

Consideration of quality of the product and overall cost involved in operation of electric furnaces. Four factors influence quality: Accuracy of temperature control; uniformity of temperature distribution; control of furnace atmosphere; and control of both heating and cooling rates. Cost includes not only cost for energy, but also labor, carrying charges, interest and depreciation, cost of rejects and subsequent avoidable processing.

—STEEL, 5-22-33

Corrosion of 18-8

By E. C. Rollason, a paper presented at the May 5 meeting of the Iron and Steel institute (England) in London, preprinted, 24 pp., 10 ills., 3 tables.

Cause of intergranular corrosion of 18-8 austenitic stainless steel is examined. Two straight chrome-nickel steels with different carbon contents, and five modifications thereof containing tungsten, copper, molybdenum, silicon and tungsten plus titanium were included in the study. Relationship between the temperature and time of heating required to cause intergranular breakdowns is set forth.

—STEEL, 5-22-33

Power Plant Fuels

By H. M. Faust, in circular No. 29 from the engineering experiment station, Ohio State university, Columbus, O.; 8 pp., 1 table.

Outlining a method for determining values of different fuels for power plant use. Six cost items are involved—fuel, overhead or fixed charge, plant maintenance, labor operating, fuel handling and ash refuse disposal, and auxiliary power.

—STEEL, 5-22-33

Mill Housing

United Effort, published by United Engineering & Foundry Co., Pittsburgh, May, p. 3, 1½ pp., 1 ill.

Description of 230,000-pound cast steel housing for 20½ x 56 x 84-inch 4-high cold strip mill being built for a leading strip producer. This mill involves pressures up to 12,000,000 pounds between the rolls and necessitated some deviation from the usual design of mill housings.

—STEEL, 5-22-33

Lathe Attachment

Machine Design, May, p. 25, 1 p., 2 ills.

Description of centrode attachment for lathes, making possible the turning, boring, and facing of cross-sectional shapes other than round. Ovals, triangles, squares, hexagons and octagons, and any shape up to 16 sides, either flat, concave or convex can be produced. The device was developed by Monarch Machine Tool Co., Sidney, O.

—STEEL, 5-22-33

Nickel, Monel Metal

By W. F. Burchfield, in bulletin T8-5 from the development and research department of International Nickel Co. Inc., New York: 11 pp., 9 ills., 3 tables.

Discussing the grinding, polishing and buffing of monel metal and pure nickel, dealing with wheels, speeds, pressures, abrasive and buffing compounds, finishes, procedure, etc.

—STEEL, 5-22-33

X-Ray Testing

By R. E. Hiller, in The Iron Age, May 11, p. 736, 3½ pp., 6 ills., 10 radiographs.

Technique involved in the radiographic examination of welds in pressure vessels ranging in thickness from less than 1 inch to more than 4 inches.

—STEEL, 5-22-33

Inclusions

By Henry D. Phillips, in The Foundry, May, p. 21, 3½ pp., 3 charts.

Study of inclusions in acid electric steel with regard to their composition, source, influence on steel properties and methods of elimination.

—STEEL, 5-22-33

Seamless Tubing

Metal Progress, May, p. 28, 4 pp., 3 ills.

Review of three decades of progress in the manufacture of seamless tubing, with special reference to recent developments in this field.

—STEEL, 5-22-33

Jigs and Fixtures

Oxy-Acetylene Tips, May, p. 101, 7 pp., 20 ills.

Discussion of the design of jigs and fixtures for welding. Illustrations show a wide variety of these devices used in production welding work.

—STEEL, 5-22-33

Inspection

By S. H. Phillips, in Western Machinery and Steel World, May, p. 148, 2½ pp.

First of a series of articles dealing with methods of examination and testing of all classes of steel materials.

—STEEL, 5-22-33

NEW EQUIPMENT

PRODUCTION FABRICATION TREATMENT FINISHING

New Shape Features Roll Scouring Brick

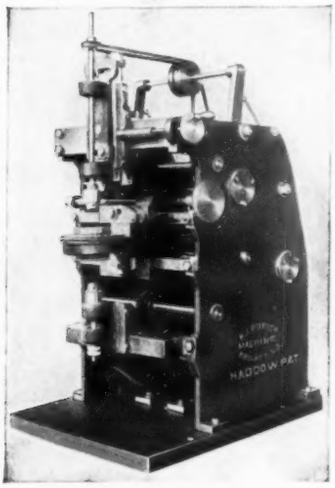
Norton Co., Worcester, Mass., recently developed an entirely new shape of roll scouring brick. Two outstanding features, rounded corners and controlled structure have been incorporated in the new product. Rounded corner roll scouring bricks are available for both hot mill and cold mill requirements. Reduction in cross breakage, spalling, chipping, and scratching are advantages of the rounded corners. By wider or more open spacing between the abrasive particles a faster scouring action is obtained without resorting to a coarser grit size. Pores or chip clearance also is greater, which permits a deeper cut.

◆

Machine Cuts and Polishes Wire Drawing Dies

H. J. Ruesch Machine Co., 401-411 Mulberry street, Newark, N. J., has placed on the market a new machine, shown herewith, manufactured under the Haddow patents, for cutting and polishing cemented carbide wire drawing dies. A vertically reciprocating spindle, which can be swiveled to obtain a maximum 45 degree included angle in the die, holds the straight wire or tapered rod. A revolving split collet, which can be swiveled, holds the die while being cut. The approach angle, the reduction area angle, and the bearing are cut at one setting of the die in the chuck. Except in the case of small diameter dies, the relief angle also is cut in the same setting.

When a tapered rod is used for cutting the various angles, one tapered rod will cut any desired angle in the die up to the 45 degree maximum. Final polishing and rounding of the edges of the die angle junctions are accomplished with a charged flexible wire, held firmly in the upper and lower spindles.



Cemented carbide dies cut, polished by new Ruesch unit

◆

Truck Adaptable for Use In Smaller Plant

Crescent Truck Co., Lebanon, Pa., recently developed a new type of truck for use in small plants where loads run on an average of about 2000 pounds. The unit is designed to operate in 52-inch intersecting aisles. Wheels are 15 inches in diameter equipped with press-on type rubber tires. Other features include two wheel steering, worm gear drive with electric motor and standard automotive type differential. The truck complete with battery weighs 1300 pounds.

◆

Announces Addition of Larger Diameter V-Belt Pulleys

American Pulley Co., 4214 Wissahickon avenue, Philadelphia, has announced the addition of pressed steel "Wedgebolt" pulleys in the larger diameters. These units utilize the hub and arm construction, the steel grooves being mounted upon the pulley face. This design is particularly desirable for V-belt drive practice because it permits true running with greater power efficiency and longer belt life, the manufacturer claims.

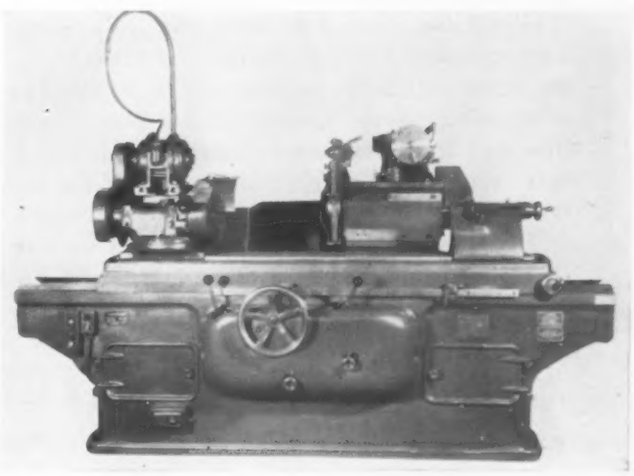
◆

Hydraulic Universal Grinder Has 14-Inch Swing

Landis Tool Co., Waynesboro, Pa., recently developed a new 14-inch swing universal grinding machine. The unit, shown herewith, is made only in the 14-inch swing, but in lengths of 36, 48 and 72 inches. Weight and strength are distributed where rigidity and wearing area are desired such as in the diameter of the spindles, oversized swivel platens, larger slides and ways.

Table traversing mechanism is of the hydraulic type using double cylinders which is claimed to give smooth traverse and reverse at all speeds. It is said that a variety of table speeds are available which with the multispeed headstock permit a selection of work and table speeds to suit the work being ground. The headstock may be swiveled to 90 degrees for face grinding. The wheelbase also may be swiveled 90 degrees on either side of the center, and it is equipped with a sub-slide so that the head may be moved forward or back as required.

Standard equipment includes an internal grinding spindle, a chuck for internal and face grinding, an automatic hydraulic wheel feed mechanism, center rest, stationary and traveling cutter tooth rests.



REMOVAL of the large cover on the front of the bed of this Landis universal grinding machine exposes all control mechanisms and pipe connections for adjustments, inspection or for repairs

WHEN BUYERS DEMAND BETTER METAL PRODUCTS . . .

Products made of sheet metal are an investment only when the metal itself is actually made to be long-lasting. Realizing this fact, many manufacturers making devices in which the sheet metal must withstand rust, insist on Toncan Iron.

Here's the proof. In 1927, the Hallenbeck Inspection and Testing Laboratory, Buffalo, N.Y., designed a moist air cabinet used in the laboratory testing of cement, using Toncan Iron sheets. The one illustrated above has been in active service since that time with no signs of the interior being affected by the moisture and water which are constantly in contact with the metal —no rusting, no pitting, no deterioration. Even the shelves which are subjected to abrasion from Ottawa sand on the briquettes and molds show no effects of corrosion.

Toncan Iron always shows to best advantage where corrosive conditions are severe, but it should always be used when the life of the sheet metal parts determines the useful life of equipment. It is an alloy of refined iron, copper and molybdenum. In the matter of rust-resistance it stands first among the ferrous metals after the stainless alloys. It is ductile—works easily—welds perfectly. It will fit into the products you make and its use will undoubtedly result in a better product.

Write for the story of Toncan Iron—"The Path to Permanence."

REPUBLIC STEEL CORPORATION

GENERAL OFFICES YOUNGSTOWN, OHIO

Ingot Rate at 40 Per Cent; Prices Move Up

Sheets Raised $3; Strip $2 for Third Quarter—Pig Iron and Reinforcing Steel Also Higher—Prospects Brighter for Strong, Active Market This Summer

ADVANCING 4 points, steelworks operations last week rose to an average of 40 per cent, highest in two years, and this week will show a further gain. While automotive requirements are well sustained and still dominate, the base of the market structure broadens each week.

The industry appears to be generating its own momentum, for actual price advances or serious threats of impending increases are driving in tonnage, which in turn emboldens producers to seek more remunerative levels. At 35 to 40 per cent operations, a majority of steel interests now are breaking even. With government control of industry almost certain to result in higher wages and prices—its objectives—the prospects for a strong market this summer become more definite.

Steel ingot production during the week increased in eight districts; remained stationary in two. At Wheeling, W. Va., the rate was 70 per cent; Cleveland, 58; Worcester, 50; Youngstown, 45; Detroit and Buffalo, 38; Chicago, 33; Pittsburgh, 25; Birmingham, 30; and eastern Pennsylvania, 18. Tin plate mills this week wll move up 20 points to 80 per cent. Six blast furnaces have been blown in this month; two more are scheduled.

Sheet prices have been advanced $3 a ton for third quarter by leading producers, and some new classifications have been adopted. Hot-rolled strip has been raised $2 a ton for that period, and cold-rolled strip to a minimum of 2.00c, which in most instances represents an increase of $2 a ton. Concrete reinforcing bars are up $4 a ton at Cleveland and Pittsburgh, and highway reinforcing material is $2 to $3 higher at New York and Boston. Pittsburgh fabricators anticipate an advance of $2 a ton on plain structural shapes for third quarter. Warehouse quantity diffentials have been adjusted, raising prices on small orders, lowering them for tonnage.

A rush to cover pig iron requirements preceded the general advance of 50 cents to $1 a ton last week in Ohio, Michigan, Indiana, Pennsylvania and Alabama, resulting in some unusually heavy tonnages booked in the lakes districts. Cleveland furnaces took more than 12,000 tons, largely for third quarter. These advances have narrowed the general spread between foundry iron prices and scrap from $7.49 a ton in 1932 to $5.75.

Scrap prices have leveled off, and in some districts are actually lower, though no basic weakness has developed in the market. Chrysler has sold 30,000 tons of scrap; and the New Haven railroad, 25,000 tons.

Structural steel awards for the week, 3090 tons, relapsed to March levels. The government construction program is not expected to be active for steel bidding until late in the summer. Specifications will be out shortly for 25,000 tons for transmission towers, Boulder dam, Nevada, to Los Angeles. New York Central will open bids May 29 on over 7000 tons of rails; Chicago Great Western has purchased 3000 tons; and the British American Oil Co. has ordered 150 tank cars from a Canadian builder.

Plate demand is broadening; 3000 tons have been placed by the Philadelphia Gas Co. Bids are being taken on four government destroyers requiring 4000 tons of plates, shapes and bars.

STEEL's iron and steel price composite this week is up 26 cents, entirely on advances in pig iron. The finished steel composite is unchanged at $45.10, while the iron and steel scrap composite has risen 25 cents to $9.41, highest since May 6, 1931.

Composite Market Averages

	May 20	May 13	One Month Ago April, 1933	Three Months Ago Feb., 1933	One Year Ago May, 1932	Ten Years Ago May, 1923
Iron and Steel Composite	$28.59	$28.33	$28.16	$28.31	$29.62	$47.52
Finished Steel Composite	45.10	45.10	44.94	45.35	47.62	68.43
Steelworks Scrap Composite	9.41	9.16	7.23	6.33	7.03	22.95

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate pipe. Steelworks Scrap Composite:—Melting steel, compressed sheets.

COMPARATIVE PRICES OF IRON, STEEL AND COKE

Representative Market Figures for Current Week, Last Month, Three Months and One Year Ago

	May 20, 1933	April 1933	Feb. 1933	Mar. 1932
Pig Iron				
Bessemer, del. Pittsburgh	$17.26	16.26	15.76	16.13
Basic, valley	15.00	14.00	14.00	15.00
Basic, eastern, del. eastern Pa.	16.19	14.19	13.50	15.00
No. 2 foundry, del. Pittsburgh	16.76	15.76	15.76	16.16
No. 2 foundry, Chicago	16.00	15.50	15.50	15.60
*Southern No. 2, Birmingham	12.00	11.40	11.00	11.00
**No. 2X, Virginia furnace	17.75	17.75	17.75	18.00
**No. 2X, Eastern, del., Phila.	16.76	14.51	13.76	14.76
Malleable, valley	15.50	14.50	14.50	15.00
Malleable, Chicago	16.00	15.50	15.50	15.60
Lake Superior charcoal, del. Chi.	23.04	23.04	23.04	23.04
Gray forge, del. Pittsburgh	16.63	15.63	15.63	15.63
Ferromanganese, del. Pittsburgh	73.24	73.24	73.24	80.24

*1.75-2.25 silicon. **2.25-2.75 silicon.

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c per gross ton, beginning Jan. 4, 1932.

Coke				
Connellsville, furnace, ovens	1.75	1.75	1.75	2.15
Connellsville, foundry, ovens	2.25	2.25	2.50	3.15
Semifinished Material				
Sheet bars, open-hearth, Youngs.	26.00	26.00	26.00	26.00
Sheet bars, open-hearth Pitts.	26.00	26.00	26.00	26.00
Billets, open-hearth, Pittsburgh	26.00	26.00	26.00	27.00
Wire rods, Pittsburgh	35.00	35.00	35.00	37.00

	May 20, 1933	April 1933	Feb. 1933	Mar. 1932
Finished Material				
Steel bars, Pittsburgh	1.60	1.60	1.60	1.60
Steel bars, Chicago	1.70	1.70	1.70	1.70
Steel bars, Philadelphia	1.91	1.91	1.91	1.91
Iron bars, Chicago	1.65	1.65	1.65	1.65
Shapes, Pittsburgh	1.60	1.60	1.60	1.60
Shapes, Philadelphia	1.65	1.65	1.65	1.75
Shapes, Chicago	1.70	1.70	1.70	1.70
Tank plates, Pittsburgh	1.50	1.55	1.60	1.60
Tank plates, Philadelphia	1.54½	1.49½	1.59½	1.79½
Tank plates, Chicago	1.70	1.70	1.70	1.70
Sheets, No. 10 blue anneal., Pitts.	1.55	1.55	1.60	1.70
Sheets, No. 24, hot ann., Pitts.	2.00	2.00	2.00	2.20
Sheets, No. 24 galvan., Pitts.	2.70	2.65	2.50	2.85
Sheets, No. 10 blue anneal., Chi.	1.80	1.70	1.85	1.85
Sheets, No. 24 hot ann., Chicago	2.25	2.15	2.15	2.35
Sheets, No. 24 galvan., Chicago	2.85	2.80	2.75	3.00
Plain wire, Pittsburgh	2.10	2.10	2.10	2.20
Wire nails, Pittsburgh	1.85	1.85	1.85	1.95
Tin plate, per base box, Pitts.	4.25	4.25	4.25	4.75
Scrap				
Heavy melting steel, Pitts	$11.75	9.90	8.35	9.75
Heavy melting steel, eastern Pa.	9.25	6.90	6.50	6.44
Heavy melting steel, Chicago	8.75	6.55	5.25	6.20
No. 1 wrought, eastern Pa.	10.25	7.35	6.50	7.75
No. 1 wrought, Chicago	8.10	5.25	5.00	5.25
Rails for rolling, Chicago	10.25	8.25	7.75	8.25

Sheets

Prices Advanced $3 a Ton for Third Quarter—Demand from Automotive Industry Sustained

SHEET PRICES, PAGE 43

Pittsburgh—Coincident with an advance of $3 in all sheet prices for the third quarter, mills have changed the cold-rolled classifications. Cold-rolled No. 10, and cold-rolled No. 20 are now classified as "mill run," No. 10 being 1.95c, Pittsburgh, and No. 20 being 2.40c. Autobody and furniture No. 10 gage will be 2.15c, Pittsburgh, for third quarter, and No. 20 gage 2.60c. Pickling extra has been advanced from 25c per 100 pounds to 35c. The third quarter price on hot-rolled No. 10 will be 1.65c; hot-rolled annealed No. 10, 1.80c; hot-rolled annealed No. 24, 2.25c; galvanized No. 24, 2.85c. Tin mill black No. 28 and enameling sheets are unchanged. Also for third quarter, long ternes No. 24 unassorted are advanced $3 a ton to 2.90c. Sheet buying is diversified and tonnage still is heavy, compared with two months ago. Several orders for metal furniture sheets have been noted recently.

Cleveland—Sheet demands from automotive, refrigerator and miscellaneous lines are holding up, fully equal to recent volume. Leading mill interests, especially those in close touch with the automotive industry, say they will be well sustained through the remainder of this month and June. Mill interests in this district are announcing an advance of $3 a ton on all grades for third quarter.

Chicago—Inland Steel Co. has advanced third quarter prices $3 a ton on all grades. This follows advances of $2 a ton announced a short time ago but provided little test so far due to rather heavy coverage at prices previously prevailing. Some small lots are being received at the higher figures. Specifications the past week were well maintained. Automotive orders appear to have leveled off but miscellaneous requirements are steady. Consumption by the electrical refrigerator industry remains active, although some decrease in demand from this industry is anticipated shortly. Mill operations are steady around 40 per cent. The current market on hot-rolled annealer sheets generally is 2.20c, with galvanized 2.80c.

Several states are awarding automobile license tag contracts; several hundred tons for Mississippi having been placed, and 700 tons pending for Texas.

Boston—Spot buying is light. Jobber, having covered ahead of the recent price advances, are specifying fairly well. Small tank builders release car lots frequently than has been the case.

New York—Sheet consumption is expanding, despite continued dullness in building lines. Sellers expect to follow the price advances just announced in other districts for third quarter.

Philadelphia—Sheet buying shows further improvement. Autobody and barrel manufacturers are the principal consumers. Lack of building is an important retarding factor in some lines.

Cincinnati—Operations at district sheet mills continue at the rate of the past three weeks, with new orders reflecting diversified demand. Road construction jobs are not taking the normal share of tonnage. Prices are strong.

St. Louis—Producers report a slight slowing down in activity, but daily sales this month average better than April's. Manufacturers of refrigerators, metal sinks and vats continue to take considerable material.

Birmingham, Ala.—More export and domestic business has warranted better production of sheets. Prices are steady.

CURRENT FINISHED STEEL PRICES

Delivered prices subject to freight surcharge corrected to nearest ½c. Asterisk denotes price change this week

Sheet Steel

HOT ROLLED No. 10 (24 to 48 inches wide)

*Pittsburgh, base	1.50c to 1.65c
*Chi. dist. mills	1.60c to 1.75c
*Chicago, del.	1.65c to 1.80c
New York, del.	1.75c
*Birm., base	1.55c to 1.65c
Philadelphia, del.	1.71c
St. Louis, del.	1.84c

HOT ROLLED ANN. No. 10

*Pittsburgh, base	1.65c to 1.80c
*Chi. dist mills	1.75c to 1.90c
*Chicago, del.	1.80c to 1.95c
Phila., del.	1.96c
New York, del.	2.00c
St. Louis, del.	1.89c to 1.99c
Birm., base	1.70c to 1.80c
San Fran., c.i.f.	2.12½c

HOT ROLLED ANNEALED No. 24

*Pittsburgh, base	2.10c to 2.25c
*Chi. dist. mills	2.20c to 2.35c
*Chicago, del.	2.25c to 2.40c
New York, del.	2.45c
Phila., del.	2.31c to 2.41c
Birm., base	2.15c to 2.25c
St. Louis, del.	2.44c
San Fran., c.i.f.	2.75c

GALVANIZED No. 24

*Pittsburgh, base	2.70c to 2.85c
*Chi. dist. mills	2.80c to 2.95c
*Chicago, del.	2.85c to 3.00c
Philadelphia, del.	3.01c
New York, del.	3.05c
Birm., base	2.75c to 2.85c
St. Louis, del.	3.04c
San Fran., c.i.f.	3.35c

TIN MILL BLACK No. 28

Pittsburgh, base	2.30c
Gary, base	2.40c
St. Louis, del.	2.64c

MILL RUN COLD-ROLLED

No. 10

Pittsburgh, base	1.95c
Chicago, del.	2.10c
Philadelphia, del.	2.26c
New York, del.	2.30c

No. 20

Pittsburgh, base	2.40c
Chicago, del.	2.55c
Philadelphia, del.	2.71c
New York, del.	2.75c

AUTO. AND FURNITURE

Pittsburgh, No. 10	2.15c
Pittsburgh, No. 20	2.60c

ENAMELING SHEETS

Pitts., No. 10	2.40c
Pitts., No. 20	2.90c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh

Tin plate, coke base, contract..	$4.25
Do., stock	3.75
*Long ternes, No. 24 unassorted	2.75c to 2.90c

Gary base, 10 cents higher.

Corrosion, Heat Resistant Alloys

Base, Pittsburgh

18% chrome, 8% nickel sheets, 35c; plates, 31c; bars, 28c.

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot Strip	19c	20.5c	23c	28c
Cold Strip	25c	26.5c	29c	34c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Steel Plates

Pittsburgh, base	1.50c to 1.60c
New York, del.	1.60c to 1.70c
Phila., del.	1.49½ to 1.59½
Boston, del.	1.72c to 1.82c
Buffalo, del.	**1.85½c**
Chicago, base	**1.70c**
Cleveland, del.	1.80½c
Birmingham, base	**1.75c**
Coatesville, base	1.40c to 1.50c
Pacific Coast, c.i.f.	1.75c
St. Louis, del.	**1.94c**

Structural Shapes

Pittsburgh, base	1.60c
Philadelphia, del.	1.65c to 1.75c
New York, del.	1.77c to 1.87c
Boston, del.	1.90½c to 2.00½c
Chicago, base	1.70c
Cleveland, del.	1.80½c
Lackawan., base	1.70c
Birmingham, base	1.75c
Pacific Coast, c.i.f.	2.10c
Do., wide flange	2.20c

Bars

SOFT STEEL

Pittsburgh, base	1.60c
Chicago, base	1.70c
Birmingham, base	1.75c
Lackawan., base	1.70c
Pacific Coast, c.i.f.	2.00c
Cleveland, base	1.65c
Philadelphia, del.	1.91c
New York, del.	1.95c
Boston, del.	2.02c
Pitts., cold finish	1.70c
Pitts., forg. qual.	1.75c and 1.85c
San Fran., c.i.f.	2.10c

RAIL STEEL

Pitts., Buff.	1.30c
Chicago, base	1.50c
Eastern mills	1.30c

IRON

Chicago, base	1.60c to 1.65c
New York, del.	1.85c to 1.90c
Philadelphia, del.	1.81c to 1.86c
Pitts., refined	2.70c to 4.20c

REINFORCING

*New billet steel, Chi., Pitts., Buff., Cleve., Birm. (cut lengths)	1.75c
Chicago, rail steel	1.30c
Phila., cut lengths	1.86c

Wire Products

(Prices apply on carload lots. Mixed carloads 10 cents higher with 10% discount off extras; joint carloads 10 cents higher with no discount from extras; pool carloads 20 cents up; less carloads 30 cents up.)

F.o.b. mills, 100 lb. keg

Standard wire nails	$1.85
Cement coated nails	1.85
Galvanized nails	3.35

(Per pound)

Polished staples	2.55c
Galvanized fence staples	2.80c
Barbed wire, gal.	2.35c
Annealed fence wire	2.25c
Galvanized wire	2.60c
Woven wire fencing (base column, c.l.)	$50.00

(To Manufacturing Trade)

Plain wire, 6-9 ga.	2.10c
Spring wire	3.10c

Anderson, Ind., $1 over Pitts.-Cleve.; Chicago, Duluth and Worcester, $2 higher; Fairfield, Ala., $3 higher.

Cold-Finished Bars

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	1.70c
20,000 to 59,999 lbs.	1.65c
60,000 to 99,999 lbs.	1.60c
100,000 lbs. and over	1.57½c

Chicago, Cleveland, Buffalo 5c higher; Detroit, 20c; eastern Michigan 25c.

Shafting

Cumberland, Md., base

1⅛-inch	3.00c
1⅛ to 1½-inch	2.50c
1⅝ to 1⅞-inch	2.20c
2⅛ to 6-inch	2.05c

Alloy Steel

Hot rolled, f.o.b. Pittsburgh, Buffalo, Chicago and Massillon, O. Base 2.45c to 2.65c. Differentials to various classes of consumers.

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.30
2500	2.25	3400	3.20

4100 .15 to .25 Mo.	0.50
4600 .20 to .30 Mo. 1.25-1.75 Ni.	1.05
5100 .80-1.10 Cr.	0.45
5100 Cr. spring	0.20
6100 bars	1.20
6100 spring	0.95
Cr., Ni., Van.	1.50
Carbon van.	0.95
9250 (flats)	0.25
9250 (rds., sq.)	0.50

Strip, Hoops, Bands

*Hot-rolled strip up to 23 15/16-in. wide, Pitts.	1.55c to 1.65c
* Do., Chicago	1.65c to 1.75c
* Do., del. Phila.	1.86c to 1.96c
* Do., del. N. Y.	1.90c to 2.00c
Cooperage hoop, Pittsburgh	1.65c
* Do., Chicago	1.75c
*Cold-rolled strip, Pitts., Cleve.	2.00c
Worcester, 3 tons or over	2.10c

Rails, Track Material

Stand. rails, mill	$40.00
Relaying rails, Pitts., 20-45 lbs.	$20.00 to 22.00
50 to 75	$16.00 to 18.00
80 to 100	$20.00 to 21.00
Light rails, 25-45, mills	$30.00
Light rails, Chi.	$32.00
Angle bars, mills	2.55c
Spikes, R. R. mills	2.15c
Spikes, boat, b'ge, Pitts.	2.65c
Track bolts, Chi.	3.50c
Do., stand., job.	73 off list
Tie plates, Pitts.	$35.00
Tie plates, Chi.	$35.00

Rivets, Wrought Washers

Struc., c.l., Pitts.-Cleve.	2.25c
Struc., c.l., Chi.	2.35c
7/16-in. & smaller, Pitts., Chi., Cleve.	70, 10 and 10 off
Washers, c.l., Pitts. dist.	6.50 to 6.75 off
Do., Chi. dist.	7.25 to 7.00 off

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chi. Discounts to legitimate jobbing or large consuming trade for full-case lots. Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread	75 off
Rolled thread ½ x 6 and smaller	75 off
Eagle list	75 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts	75 off
Tire bolts	60 and 10 off

Stove bolts, 75, 25 and 10 off in pkgs.; 86 off in bulk, 5000 or more of a size.

Rolled thread machine bolts, ½ x 6 and smaller 75 off.

NUTS

Semifinished	75 off

HEXAGON CAP SCREWS

Milled	85 off
Upset 1-in. diam., smaller	85-10 off

SQUARE HEAD SET SCREWS

Upset, 1-in., smaller	80 off
Upset, larger than 1-in.	80 off
Headless set screws	75-10 off

Cut Nails, Piling

Cut nails, c.l., Pitts.	$2.50
Do., less carloads, 5 kegs or over	$2.90

Steel piling, Pitts. 1.90c to 1.95c

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pittsburgh and Lorain, O., to consumers in carloads, Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago delivered, 2½ points less. Wrought pipe, Pittsburgh base.

All discounts are net.

BUTT WELD

Steel

In.	Blk.	Gal.
¼ and ⅜	60½	42
½	65½	54
¾	69	59
1—3	71	62

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD

Steel

2	66	57
2½ to 6	69½	60½
7 and 8	68	58
9 and 10	67	57
11 and 12	66	56

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½
9—12	38	24½

(*Please turn to next page*)

RAW MATERIAL PRICES

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c gross ton, from Jan. 4, 1932, except Buffalo del. at Boston. Asterisk denotes price change.

LINE PIPE

Steel

⅛-inch, butt weld	54
¼—⅜, butt weld	59½
½, butt weld	64½
¾, butt weld	68
1—3, butt weld	70
2-inch, lap weld	65
2½—6, lap weld	68½
7—8, lap weld	67
9—10, lap weld	66
11—12, lap weld	65

Iron

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe list. 8—12 inch no extra. 2-inch line discount unchanged from list prior to April 15, 1933.

BOILER TUBES

C. L. Discounts, f.o.b., Pitts.

Lap Welded Steel		*Charcoal Iron*	
2—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¾—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Quantity discounts, same as for hot rolled below. Charcoal Iron—Under 10,000 pounds; 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES

Cold Drawn

1 inch	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

Hot Rolled

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½, 5, 6	46

Quantity discounts are: Under 10,000 pounds, 10 points and 5 per cent; 10,000 to 24,999 pounds, 6 points and 5 per cent; 25,000 pounds to carload, 2 points and 5 and 5 per cent; carload and over, base discount and 5 and 5 per cent. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs. 40%
15,000 ft. or 22,500 lbs. 70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$32.00-33.00
4-in. Birm.	35.00-36.00
4-in. Chicago	43.40-44.40
6 to 24-in. Chicago	40.40-41.40
6-in. & over, N. Y.	32.00-34.50
4-in. New York	34.50-36.50

Class A pipe $3 over Class B. Stand. fitgs., Birm. base..$90.00

Six to 24-inch, fittings, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

Pig Iron

Per Gross Ton

FOUNDRY NO. 2

Chicago, furnace	$16.00
*Pitts., dist. fur.	16.00
*Pittsburgh, del.	16.63-17.13
*Valley furnace	15.50
*Cleve. fur., loc. del.	15.50
*Philadelphia, del.	16.26
Virginia furnace	17.25
*Granite City, Ill.	16.00
*St. Louis, del.	16.85
Buff., fur., local del.	16.00
Buff., all-rail, Bost.	19.05
*Buff., del. Brook.	18.25-18.75
*Buff., del. Newark	16.75-17.25
Ala., Birmingham	12.00
*Ala., del. Chicago	16.25-16.78
*Ala., del. St. Louis	16.35
*Ala., del. Cincinnati	16.51
Ala., Phila., dock del.	17.00-17.25
Ala., Balt., dock del.	17.00
Ala., N. Y. dock	17.50
Ala., Bost. dock del.	17.50-17.75
Tenn., Bir. base	13.00
*Tenn., del. Cinci.	16.51
Montreal, del.	23.00-23.50
*Eastern, del. Phila.	16.76

FOUNDRY NO. 2X

Buff., fur., local del.	16.50
*Buff., del. Brook.	18.75-19.25
* Do, Newark	17.25-17.75
Buff., all-rail, Bost.	19.55
Virginia furnace	17.75
*Eastern, del. Phila.	16.76

FOUNDRY NO. 1X

Buff., fur., local del.	17.50
*Eastern, del. Phila.	17.26
*Buff., del. Brook.	19.25-19.75
*Buff., del. Newark	17.75-18.25

MALLEABLE

*Valley furnace	15.50
*Cleve. fur., loc. del.	15.50
*Pittsburgh dis. fur.	16.00
*Pittsburgh, del.	16.63-17.13
Chicago, furnace	16.00
Buff., fur., loc. del.	16.50
*Eastern Pa., del.	17.13-18.91
*Granite City, fur.	16.50
Montreal, del.	24.00
Toronto, delivered	22.60

BASIC

*Pitts., dist. fur.	15.50
*Pittsburgh, del.	16.13-16.63
*Eastern Pa., del.	16.00-16.25
Buff., fur., loc. del.	15.50-16.00
Montreal, del.	23.50
*Valley, furnace	15.00

BESSEMER

*Valley furnace	16.00
*Pittsburgh fur.	16.50
*Pittsburgh, del.	17.13-17.63

LOW PHOS.

*Valley fur. stand.	24.00-25.00
Phila., standard	22.76-26.79
Copper bear., E. Pa. furnace	22.00-23.00

GRAY FORGE

*Valley furnace	15.50
*Pitts., dist. fur.	16.00
*Pittsburgh, del.	16.63-17.13

CHARCOAL

Lake Sup., del. Chi.	23.04

SILVERY

Jackson County, O., fur. 7%—$18.50; 8—$19; 9—$19.50; 10—$20; 11—$21; 12—$22; 13—$23; 14—$24; 15—$25; 16—$26 17—$27.

*Pittsburgh and Buffalo furnace; 7 to 10—$20; 15—$23.

BESSEMER FERROSILICON

Jackson County, O., fur., 10%—$20.50; 11—$21; 12—$21.50; 13—$22.50; 14—$23.50; 15—$24; 16—$25; 17—$26.50.

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports

Old range bess.	$4.30
Mesabi bessemer	4.65
Old range nonbess.	4.65
Mesabi nonbess.	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents, unit, del. E. Pa.

Foundry and basic, 56-63%, con. (nom.)	7.50
Copper-free low phos. 58-65%	nom.

FOREIGN ORE

Cents per unit, f.a.s. Atlantic ports (nom.)

Foreign manganiferous ore, 45-55% iron, 6-10% man.	8.00
No. Afr. low phos.	7.00
Swedish basic, 65%	7.50- 8.00
Swedish low phos.	8.00
Spanish, No. Afr. basic, 50 to 60%	7.00
*Tungsten, spot, sh. ton unit, duty pd.	$10.75-11.00
N. F. fdy., 55%	7.00
*Chrome ore, 48% gross ton c.i.f.	$16.50-17.50

Manganese Ore

(Nominal)

Prices, not including duty, cents per unit, cargo lots.

Caucasian, 52-55%	nominal
So. African, 52%	18 to 19 cts.
So. Afr., 49-51%	nominal
Indian 48-50%	nominal

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pa., Ohio, Ill., Ky., Md., Ga., Ala.	$35.00
Missouri	35.00

Second Quality

Pa., O., Ill., Ky., Md.	30.00
Missouri	30.00
Georgia, Alabama	30.00

MALLEABLE BUNG BRICK

All bases	40.00

SILICA BRICK

Pennsylvania	$35.00
Joliet, E. Chicago	47.00
Birmingham, Ala.	50.00

MAGNESITE BRICK

Per Net Ton, 9 x 4½ x 2½

Burned	$65.00
*Unburned	55.00

CHROME BRICK

Per Net Ton

F.o.b. ship. point	$45.00

MAGNESITE

*Dead burned grain, Chester, Pa., Baltimore bases, net	40.00
Domes, Chewelah, Wash., base	22.00

Fluorspar

85 to 5 per cent grade

Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$11.50
Washed gravel, import duty paid tide, gross ton	$17.50

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pitts., Chi., Cleve., open-hth. & bess.	$26.00
Philadelphia	31.75
Forging, Pitts., Chi.	31.00

SHEET BARS

Pitts., Cleve., Yong.	26.00
Chicago	26.00

SLABS

Pitts., Cleve., Yong.	26.00

WIRE RODS

Pitts., Cleveland	$35.00
Chicago	36.00

SKELP

All grades, Pitts.	1.50c-1.60c

Coke

Price Per Net Ton

BEEHIVE OVENS

Connellsville fur.	$1.75
Connellsville fdry.	2.25- 2.50
Connell, prem. fdry.	4.00
New River fdry.	6.00
Wise county fdry.	4.25- 5.00
Wise county fur.	3.50- 4.25

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.21- 8.81
Chi. ov., outside del.	7.00
Chicago, del.	7.75
New England, del.	10.00
St. Louis, del.	7.75
Birmingham, ovens	4.00
Indianapolis, del.	7.75
Ashland, Ky., ovens, Connell., basis	4.50
Portsmouth, ovens Connell. basis	4.50
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.00
Philadelphia, del.	8.50

Ferroalloys

(In dollars, except Ferrochrome)

Ferromanganese, 78-82% tidewater, duty pd.	$68.00
del. Pitts.	73.24
Spiegeleisen, 19-20%, dom., fur., spot†	24.00
Ferrosilicon, 50%, frieght all., c. l.	74.50
Do, less carload	82.50
Do, 75 per cent	120-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb.	85.00
2% carbon	90.00
1% carbon	100.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	9.50
Do, spot del.	10.00
Ferrotungsten, stand., lb., cont.	0.94- 1.00
Ferrovanadium, 35 to 40%, lb. cont., on analysis	2.60- 2.80
Ferrotitanium, c.l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt., all., lb.	8.50
Do, under 1 ton	9.00
Ferrophosphorus, per ton, c. l. 17-19%, Rockdale, Tenn., basis; 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24%, $2.75 unitage	65.00
Ferromolybdenum, stand. 50-60%, lb	0.95
Molybdate, lb. cont.	0.80

†Carloads. Diff. to apply to quantity.

Bars

Needs of Varied Consumers Hold Orders to Good Rate—Higher Prices Contemplated

BAR PRICES, PAGE 43

Pittsburgh—Forging quality bars and other types of merchant bars for the automotive trade still are in fair demand. Although there was a slight decline last week in miscellaneous bar buying, the market still is strong. No change in the 1.60c base on bars is reported. One bar mill's bookings here are running 10 to 20 per cent ahead of April and approximately 50 per cent ahead of March. Deliveries have not been greatly affected and mill shipments are prompt. Alloy bar demand is still strong and a base of 2.45c to 2.65c, mill, continues.

Cleveland—Inquiries for commercial steel bars for third quarter have developed, but makers are cautious in committing themselves, some refusing to quote, believing that with the federal plan for price stabilization, employment and wages, and increasing values of raw material, the market will be higher. Automotive demand was steady during the week, taking about 60 per cent of production here. Railroad and building requirements were slack, but miscellaneous orders included a larger number of manufacturers. Makers of shovels, spades and axes say government reforestation work has helped their business. Large shovel builders also are more active. The market is firm at 1.65c, base, Cleveland.

Chicago—Steel bar specifications continue at their recently improved rate with no slackening in automotive orders yet apparent. Requirements of miscellaneous consumers continue active with demand recently tending toward better diversification. The improved outlook in the agricultural implement industry as yet has not been translated into a definite increase in bar orders, but some betterment is expected soon. Specifications from railroads remain light. Higher third-quarter prices are looked for although no change has been announced and the market generally continues 1.70c, Chicago, for soft steel bars, 1.50c for rail steel, and 1.60c for bar iron.

Boston — Bars show somewhat smaller demand after the recent activity, most orders being for immediate shipment. The price is steady at 1.60c, Pittsburgh.

Philadelphia — Prospects of an early advance in the price of commercial steel bars have forced further improvement in buying here, with jobbers specifying more freely. Fair bar tonnage will be required for the four destroyers now being figured by shipbuilders. Incidentally, it is understood that no one yard will be permitted to accept contracts for more than two of these destroyers. Commercial steel bars are 1.60c, Pittsburgh, or 1.91c, Philadelphia, and common iron bars, 1.50c, Pittsburgh, or 1.81c, Philadelphia.

Tin Plate Operations At 80 Per Cent This Week

Tin Plate Prices, Page 43

Pittsburgh — Tin mill operations last week averaged 60 per cent, but this week they will step up to 80 per cent. American Sheet & Tin Plate Co., Pittsburgh, beginning this week will operate all of its tin mills at Farrell, Pa., Shenango, Pa., Laughlin, National and Gary works, at 100 per cent. A 100 per cent rate also is reported for Weirton Steel Co., Wheeling Steel Corp., and McKeesport Tin Plate Co. in this district. The 80 per cent average rate probably will continue for at least several weeks, due to a pronounced spread in buying for domestic use. Leading among this buying is that for pineapple canners. One recent order for shipment to Hawaii calls for several hundred thousand base boxes. More tin mill black sheets have been bought and the base of 2.30c, Pittsburgh, is stronger since certain concessions of $2 and $4 a ton have been eliminated. The contract price of tin plate continues $4.25.

Cold-Finished Strong as Motor Needs Continue

Cold Finished Prices, Page 43

Pittsburgh — As an automobile assembly month, June promises to be as heavy as May and consequently cold-finished steel bar shipments still show a strong trend. Recent cold bar buying includes some important automotive parts orders, with some tonnage for spark plug makers. Miscellaneous buyers are still evident. The present base price of 1.70c, Pittsburgh, continues firm.

Plates

Barge and Oil Tank Needs Give Some Orders, with More Tonnage in Prospect

PLATE PRICES, PAGE 43

Pittsburgh — Several river barge orders to be publicly announced next week have been informally closed and although the tonnage of plates involved is under 1000 tons, this start on a large pending tonnage is encouraging. Mill specifications for plates fell off the latter part of last week although the decline was not great. No change in the plate price from 1.50c to 1.60c was noted with three plate mills in the Mid-west still reported using a 1.50c, Pittsburgh, base quite generally. A 90-ton landing stage for the Ohio River Co., Cincinnati, has been placed. A local barge builder will build two 34 x 150-foot coal barges for the Costanzo Coal Co., Wheeling, W. Va.

Chicago—While the outlook for heavier plate demand is moderately favorable, orders recently have shown little change. The oil industry has a fair volume of refinery construction work in prospect that will require considerable plate tonnage, while better orders are expected from railroads. Freight car repair activity recently has shown little improvement and it is thought considerable equipment will be scrapped rather than repaired. Plates continue 1.70c, Chicago.

Boston—Plate prices are steadier, with 1.50c, Coatesville, Pa., the minimum on most sales. Mills are backward about closing for third quarter, though some consumers have asked contracts for that delivery. Demand is mainly for small and miscellaneous lots. Several hundred tons have been placed for brewery work and a mill in the Pittsburgh district will furnish about 500 tons for tanks at Chelsea, Mass.

Philadelphia — Bids are being asked for construction of four destroyers, each requiring about 650 tons of plates and 450 tons of shapes and bars. While eastern plate mills are increasing operations somewhat, this appears to be due chiefly to buying outside the district. The only important order placed here recent-

ly is that of the Philadelphia Gas Works, involving close to 4000 tons of plates and shapes. Fabrication of this business went to Cruse-Kemper Co., Ambler, Pa., which awarded the plates to two Eastern Pennsylvania mills and the shapes to two other eastern Pennsylvania producers. Prices continue firmer, with an early advance likely.

New York—Higher prices on steel plates continue in prospect, though they may not be effective before third quarter. About 1600 tons will be required for a penstock for the Union Carbide & Carbon Corp., New York, at Alloy, W. Va. Bids on four destroyers, requiring about 4000 tons of steel will be opened July 6.

Contracts Placed

3000 tons, gasholder work for Philadelphia Gas Co., Philadelphia, through Cruse-Kemper Co., Ambler, Pa., fabricator, to two eastern Pennsylvania mills; in addition, 1000 tons of shapes were placed with two other eastern mills; fabrication contract erroneously reported last week as going to a Pittsburgh shop.

500 tons, tanks for Jacob Ruppert Brewing Co., New York, to Pfaudler Co., Rochester, N. Y.

320 tons, two 34 x 150 foot coal barges for the Costanzo Coal Co., Wheeling, W. Va., to American Bridge Co., Pittsburgh.

Contracts Pending

2600 tons, four destroyers, navy, construction bids being asked; in addition approximately 1400 tons of shapes and bars required.

Unstated tonnage, steel hoppers, coaling plant, navy yard, New York; McHarg Co., low on general contract.

Railroads

Chicago Great Western Buys 3000 Tons Rails; Market Quiet

Track Material Prices, Page 43

Award of 3000 tons of steel rails by the Chicago Great Western was the feature of the market last week. Illinois Steel Co. was given 2000 tons and Inland Steel Co. 1000 tons. Some additional small orders and releases against contracts has given rail mills in the Chicago district some activity.

The rail mill of the Edgar Thomson works of Carnegie Steel Co. at Braddock, Pa., was also active last week on rails for the Pennsylvania. An additional blast furnace stack was lighted at this plant to supply sufficient hot metal. This is the first blast furnace activity at this plant in 21 months.

New York Central will open bids May 29 on over 7000 tons of steel rails.

Track accessories are being released somewhat more freely at Chicago and some steel for repairs is moving from mills at Chicago and Pittsburgh. Question of repair or retirement of much old rolling stock is in the balance. Pere Marquette is scrapping 4000 cars.

Prices of track and other steel railroad accessories are steady and have undergone no change recently.

Car Orders Placed

British American Oil Co., Toronto, Ont., 150 tank cars, to Canadian Car & Foundry Co. Ltd., Montreal.

Locomotives Placed

Navy, bureau of supplies and accounts, Washington, one 25-ton gasoline-electric drive, to Fate-Root-Heath Co., Plymouth, O., $11,970; one 18-ton gasoline-mechanical drive, to Mid-West Locomotive Works, Hamilton, O., $4986; three 8-ton gasoline-mechanical drive, to Whitcomb Locomotive Co., Rochelle, Ill., $2660 each; bids May 8.

Rail Orders Placed

Chicago Great Western, 3000 tons; 2000 tons to Illinois Steel Co. and 100 tons to Inland Steel Co., Chicago.

Strip

Cold-Rolled Is Advanced $2 At Chicago—Orders Small

Strip Prices, Page 43

Chicago—Strip specifications and production are steady, with output holding about 30 per cent. While some leveling off tendency is noted in automotive demand, there is no definite slackening and orders from miscellaneous consumers are holding well. While individual orders are light, the number has improved consistently over recent weeks. The price on cold-rolled has been advanced $2 per ton, to a basis of 2.00c, Pittsburgh-Cleveland. Hot rolled strip is up $1 to 1.70c.

Pittsburgh — With demand from many widely spread sources strong, deliveries, especially on hot-rolled strip, are slightly larger than a few weeks ago. Hot-rolled strip is quoted at 1.60c, Pittsburgh, with 1.70c to be asked for third quarter. There are still some small orders for cold strip at 2.00c but average selling prices range around 1.90c. An advance of $2 per ton at Chicago to 2.00c, Pittsburgh, for third quarter will be followed here.

Cleveland—Strip steel orders and specifications are holding fairly well to the recent level. Demand from the automotive industry has not tapered, but some makers report slightly less from refrigerator manufacturers. Most hot-rolled strip now being shipped is being billed at 1.45c, Pittsburgh, on former contracts, though quotations for third quarter now are 1.60c, Cleveland. Cold-rolled is up $2 for third quarter, at a minimum of 2.00c, Pittsburgh-Cleveland.

Boston—Cold-rolled strip is active and firm with 2.10c, Worcester, applying on current business. No third quarter business is being booked at that price.

Philadelphia—An advance not only in cold-rolled strip but also in hot-rolled material, prices on which were increased at the beginning of this quarter, appears in prospect. Some sellers look for an announcement which will affect both grades by the end of this month. Hot strip is quoted at 1.55c, Pittsburgh, or 1.86c, Philadelphia, and cold-rolled at 1.80c to 1.90c, Pittsburgh, 2.11c to 2.21c, Philadelphia.

Wire

Jobbers Take Heavier Lots; No Third-Quarter Price

Wire Prices, Page 43

Pittsburgh—No action has been officially taken to confirm an expectation that the wire prices are to be advanced. Prices in the spot market are generally based on $1.85 for nails and 2.10c base, Pittsburgh, for plain wire for manufacturing.

Cleveland—Practically all classes of consumers of wire and wire products now are buying to some extent, due to low stocks and improvement in their business. Some consumers not heard from in five or six months have placed orders. Nut and bolt manufacturers have been especially active.

Chicago—Wire specifications and shipments continue active, aided by a better movement to jobbers and sustained demand from most manufacturers and wire consumers. Business the past week maintained previous gains and May is expected to be the most active of a year. Demand for manufacturers' wire is better diversified with automotive requirements well maintained. Prompt shipments is requested on most orders. Announcement of third quarter prices is awaited. The market is $1.90 on wire nails in carloads and 2.15c for plain wire.

Worcester, Mass.—Mills refuse to

take contracts for third quarter at present prices. Demand is active, especially for specialties and miscellaneous needs. General improvement is noted. Nails hold recent gains. Worcester mills are expected to supply at least part of the wire for the San Francisco-Oakland bridge.

Warehouse

New Quantity Differentials Set; Small Lots the Rule

Cleveland—Leading warehouses have announced new quantity differentials on hot-rolled bars, plates, shapes, hoops, bands and blue annealed sheets, raising the price on the small orders which have been flooding them recently, and making substantial reductions on those of 400 pounds or more. An extra of 50 cents per 100 pounds now applies on lots of less than 400 pounds; the base price applies on 400 to 999 pounds; 1000 to 4999 pounds take 20 cents per 100 pounds off base; 5000 to 9999 pounds, 40 cents off; 10,000 to 39,999 pounds, 60 cents off; and 40,000 pounds and over, 75 cents off. Some of the large consumers are among those who have restricted individual purchases to the small lots which warehouses classify as unprofitable, due to handling costs.

Warehouse prices are omitted this week. Prices are unchanged from last week except for adjustments in sheet prices at Buffalo and Baltimore.

Pittsburgh—Steel jobbers find May orders 10 to 15 per cent better than April and April had been the best month of 1933. Prices on hot-rolled bars, plates, shapes and cold-drawn bars may be advanced for third quarter if mill prices are advanced.

Chicago—Sales continue to gain steadily and recent business, in addition to being the best so far this year, exceeded that for the corresponding 1932 period. Betterment continues in size as well as number of orders. Prices are unchanged, but quantity differentials on lots of 1000 pounds and over have been reduced, effective May 18.

Boston—Increase in number of small orders for diversified products has increased warehouse volume encouragingly. Prices are steadier.

New York—Volume of small orders holds well with steel warehouses, aggregate showing encouraging gains. Buying is well spread and prices are steadier.

Philadelphia—While volume continues to show only a slight gain, jobbers report a large number of orders. Prices are unchanged.

Buffalo—Demand for warehouse materials is better than at any time this year. Sales are principally of cut sizes, indicating immediate use.

Detroit—Each succeeding week develops further though mild improvement in demand for iron and steel out of warehouse, and May totals will show an improvement over April, paralelling the April betterment over March. Prices are unchanged. New quantity differentials have been adopted. (These are the same as presented under Cleveland dateline, in the first column).

Cincinnati—Improved demand for warehouse materials continues, with individual orders heavier and to interests long out of the market.

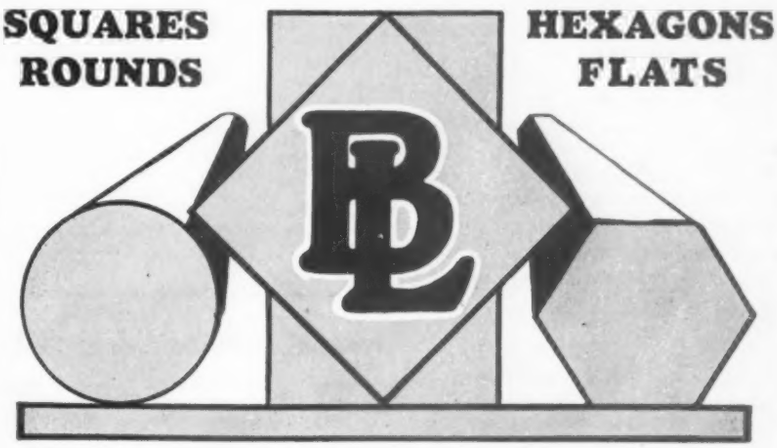
Cold Drawn Steels

One great division of Industry after another has grown to recognize the quality and service rendered by this National source of supply. Your every cold finished bar requirement will be carried out with precision and promptness that will please. Our two well equipped mills located at Buffalo, New York and Harvey, Illinois stand ready to serve you. We earnestly solicit your inquiry or order involving cold finished bar steels.

EXTRA WIDE FLATS
SPECIAL SECTIONS

SQUARES
ROUNDS

HEXAGONS
FLATS



BLISS & LAUGHLIN, INC.

Western Mill
Harvey, Ill.

Eastern Mill
Buffalo, N. Y.

Sales Offices in all Principal Cities

Structural Shapes

Volume of Awards Is Smaller—Little Tonnage Expected Until Public Works Program Gets Under Way—Pittsburgh Fabricators Expect Higher Prices

STRUCTURAL SHAPE PRICES, PAGE 43

Pittsburgh—Independent fabricators and other structural shape buyers expect an advance of $2 a ton for plain material in the next quarter, but the producing mills have not definitely confirmed this report. Structural inquiry is heavier. A plant extension at Charleston, W. Va., for the Libby Owens Glass Co., Toledo, O., is planned and some extensions at Meadville, Pa., for the Valley Mead Brewing Co. will take material. In general, 1.60c base, Pittsburgh, is the present market.

New York—Fabricated structural steel demand is light, with little new and active inquiry out. No action has been taken on the 12,000-ton award for the mid-town post-office, and the government construction program is not expected to be active for steel bidding until late in the summer. Plain material is unchanged at 1.60c, Pittsburgh.

Specifications are expected out shortly on approximately 25,000 tons of structural steel for towers for the transmission lines from Boulder dam, Nevada, to Los Angeles.

Cleveland—Bridge and building construction work still is slow, although it is understood the state plans to revive in June the various projects it suspended in March. For a waterworks at Conneaut, O., on which bids were taken May 20, 160 tons of sheet piling will be required, in addition to 130 tons of concrete bars and 225 tons of plates. A Youngstown, O., fabricator has booked 107 tons of shapes for a recreation hall at Geauga Lake, O.

Chicago—Slight improvement in number of inquiries for private work involves little gain in tonnage, most new projects being small. Awards also are light. Inquiry for piling is expanding. Among the largest items is 600 tons for shore protection at Ft. Screven, Ga. A street car bridge for the World's fair will take 500 tons of shapes.

Boston—Structural shape demand lags behind other finished products, although small construction projects are slightly more active. The Charlesgate fill and wall here will take about 130 tons of piling. Plain material is unchanged at 1.60c, Pittsburgh.

Philadelphia—Another dull week prevailed in structurals. No sizable tonnage was placed, and new inquiry was small. Bids will be opened this week on the 5000-ton pier project of the Pennsylvania railroad at Baltimore, and several hundred tons of shapes will be required for four destroyers on which shipyards are being asked to figure. Standard shapes are 1.60c, nearest mill, or 1.65c, Philadelphia.

Buffalo—The outlook for structural steel sales in this district is the best in two years or more, according to fabricators. Fully 25,000 tons are pending for early closing, in addition to about 2000 tons placed during the week.

Contracts Placed

500 tons, high school, Wolcott, N. Y.; bids June 6.

400 tons, sheet piling, contract No. 2 West bay superstructure, San Francisco-Oakland bridge, San Francisco, to unnamed interest.

300 tons, truss spans and I-beams, bridge, Devils river, highway 3, Texas, to Virginia Bridge & Iron Co., Roanoke, Va.

260 tons, University of Buffalo recreation building, Buffalo, to C. F. Ernst, Buffalo.

250 tons, trestle for Six Companies, Boulder City, Nev., to Consolidated Steel Corp., Los Angeles.

230 tons, bridge No. 60, for Louisville & Nashville railroad, Henderson, Ky., to Virginia Bridge & Iron Works, Roanoke, Va.

215 tons, factory building, Berger Bros., New Haven, Conn., to Bethlehem Fabricators Inc., Bethlehem, Pa.

200 tons, additional, Lang's brewery, Buffalo, to R. S. McMannus Steel Construction Co., Buffalo.

180 tons, printing plant, Wilson-Jones Co., Elizabeth, N. J., to Breen Iron Works, Newark, N. J.

180 tons, building, Krug Baking Co., Jamaica, N. Y., to Ingalls Iron Works Co., Verona, Pa.

150 tons, highway bridge, Torrington county, Texas, to North Texas Iron & Steel Co., Fort Worth, Tex.

150 tons, highway bridge at Hughes, Ark., to Pidgeon-Thomas Iron Co. Inc., Memphis, Tenn.

107 tons, recreation hall, Geauga Lake, O., to Truscon Steel Co., Youngstown, O.

38 tons, bridges, Decatur, Ill.; 200 tons for Wabash railroad and 100 tons for Illinois Central railroad, to Mississippi Valley Structural Steel Co., Decatur, Ill.; 68 tons for Baltimore & Ohio bridge to Jones & Laughlin Steel Corp., Pittsburgh.

100 tons, Stewart avenue bridge, Ithaca, N. Y., to R. S. McMannus Steel Construction Co., Buffalo.

Shape Awards Compared

	Tons
Week ended May 20	3,090
Week ended May 13	10,015
Week ended May 6	125,675
This week in 1932	20,623
Weekly average, 1932	14,285
Weekly average, 1933	15,206
Weekly average, April	8,912
Total to date, 1932	290,348
Total to date, 1933	319,339

Contracts Pending

25,000 tons, towers for transmission lines, Boulder dam, Nevada, to Los Angeles; specifications expected out shortly.

1500 tons, jail, San Francisco; general contract to MacDonald & Kahn, San Francisco.

900 tons, highway bridges, Missouri, in addition to 1500 tons previously pending.

800 tons, bridge over Santa Fe tracks, San Bernardino, Calif.; bids soon.

600 tons, piling, shore protections, Ft. Screven, Ga.

500 tons, Twelfth street street-car bridge, World's fair, Chicago.

425 tons, addition, House of Refuge, Albion, N. Y.; bids shortly.

200 tons, brewery, Louisville, Ky.

200 tons, industrial building for state of Pennsylvania, Graterford, Pa.

160 tons, sheet piling, waterworks, Conneaut, O.; bids May 20.

130 tons, piling, Charlesgate fill and wall, Boston; Coleman Bros. Inc., Boston, general contractors.

130 tons, coal storage system and utilities, Mitchell Field, Long Island, N. Y.; Durso Construction Co., low on general contract.

100 tons, bars and anchorage rods, bulkhead, Jenney Mfg. Co., Chelsea, Mass.; Bay State Dredging Co., East Boston, contractor.

Higher Bolt, Nut Prices Seen for Third Quarter

Bolt, Nut, Rivet Prices, Page 43

Expectation of higher prices for bolts and nuts for third quarter is general, and opening of books for that delivery is delayed until the situation clears. Pittsburgh makers do not expect to take contracts for that delivery until after June 1. Efforts by automotive users to cover for the remainder of the year have been ineffectual.

Cleveland and Pittsburgh producers find orders as much as 50 per cent above April and the best of the year, as well as being ahead of May, 1932. At Chicago there is a slight improvement. Railroad buying is awaited there as the necessary im-

petus to any decided gain. Current prices are steady at 75 off for nuts and bolts, 2.25c, Pittsburgh, and 2.35c, Chicago, for structural rivets.

Coke

Foundries Take More Fuel; Prices Show No Change

Coke Prices, Page 44

Little change is taking place in demand for and shipments of coke. Foundry coke requirements are growing steadily and May promises to be the best of the year to date in this grade in some centers. Banking of a blast furnace stack at Monessen, Pa., is balanced by one blown in at Sharpsville, Pa.

Some interest is being manifested in last-half supplies but no price has been named. By-product grades in general are making some gain while beehive is in less demand at Pittsburgh.

Connellsville foundry coke is quoted at $4 for premium brands and $2.25 for common brands. By-product at Chicago is $7, ovens, for outside delivery and $7.75 for local users. At St. Louis by-product coke is $7.75, delivered.

Ore Consumption Increases; Taxes Again To Be Issue

Iron Ore Prices, Page 44

Cleveland—Recent gains in pig iron production, and the fact that four blast furnace stacks were blown in during the past week, and at least two more are about to be started, lead Lake Superior iron ore producers to believe that shipments this year may go higher than they anticipated. Consumers now are estimating their requirements. As business this year will be restricted almost entirely between associated companies there is little disposition to name prices at this time. Several iron ore companies are withholding payment of taxes in Minnesota for the last half of 1932 and will test in the courts the validity of assesments.

The Lake Superior Iron Ore association's current report on ore consumption and stocks follows:

	Tons
Consumed in March	593,024
Consumed in April	771,972
Increase in April	178,948
Consumed in April, 1932	1,039,799
Ore at furnaces May 1, 1933	23,878,614
Ore on Lake Erie docks May 1, 1933	4,969,363
Total at furnaces and Lake Erie docks May 1, 1933	28,847,977
Total, May 1, 1932	33,478,882

Concrete Bars

Prices Are Advanced at Cleveland, New York, Boston and Pittsburgh—Specifications Larger in Some Districts—Inquiries Are Increasing at Chicago

REINFORCING BAR PRICES, PAGE 43

Pittsburgh—An advance of $4 a ton has been announced ih the price of concrete bars. Previously makers quoted 1.55c for cut lengths, and 1.40c as the distributors' base. The advance brings the distributors' price up to a parity with merchant steel bars at 1.60c, and with cut lengths taking their usual differential over this figure the new price will be 1.75c. Mill specifications here are heavy, though in small lots.

Cleveland—New billet steel reinforcing bars have been advanced $4 a ton to 1.50c, base, Cleveland, to distributors, in line with similar adjustments made recently in some other districts. Competition has been extremely keen for the small jobs in northern Ohio. On a 65-ton job at Toledo, O., a Detroit interest's low bid is reported to have been $6 a ton under what the local fabricators considered the market. Road mesh will be more in demand next month when the state takes bids on projects held up in March.

Chicago—Inquiry for small lots of concrete bars for private construction are increasing. Outstanding among private projects is the Chicago Carton Co. building requiring more than 1000 tons which are expected to be closed shortly. For a Sheboygan, Wis., courthouse, 300 tons have been placed.

Boston—Effective May 20, prices of highway mesh were advanced 5 per cent, or $2 to $3 a ton, on various types. Pending reuirements for New England highways and bridges are heavier. Building demands are light.

New York—Highway mesh prices have been advanced 5 per cent, averaging about $3 a ton, the increase following the recent rise in billet steel bars. Inquiry for mesh is heavier and 300 tons for an upstate highway has been placed. Bars are inactive and prices are untested on new business.

Philadelphia—Apart from one order for about 150 tons of mesh and bars for road work at Norristown, Pa., the market is quiet. Sellers look for little improvement before June, when state roadwork probably will bring out some tonnage.

Concrete Awards Compared

	Tons
Week ended May 20	**1,985**
Week ended May 13	**6,317**
Week ended May 6	**7,578**
This week, 1932	**3,275**
Weekly average, 1932	**3,920**
Weekly average, 1933	**3,188**
Weekly average, April	**2,169**
Total to date, 1932	**93,477**
Total to date, 1933	**66,946**

Contracts Placed

500 tons, highway, Onondaga county, New York, to Kalman Steel Corp., Bethlehem, Pa.; through Warren Bros. Roads Co., Cambridge, Mass.

300 tons, courthouse, Sheboygan, Wis., to Inland Steel Co., Chicago.

300 tons, highway, Taughannock State Park, Ithaca Highway 1921, Tompkins county, New York, to American Steel & Wire Co., Pittsburgh; John Bellardino, Seneca Falls, N. Y., general contractor.

260 tons, outlet tunnels for San Gabriel Calif., to Soule Steel Co., San Francisco.

150 tons, mesh and bars for road work being constructed jointly by township and Pennsylvania railroad, Norristown, Pa., to Taylor-Davis Inc., Philadelphia.

140 tons, highway and grade separation at Northern State Parkway, Nassau county, New York, to Kalman Steel Corp., Bethlehem, Pa.; through P. T. Cox Contracting Co.

135 tons, highway, Albany county, New York, to Kalman Steel Corp., Bethlehem, Pa.; through Johnson, Drake & Pipe Inc., Freeport, Ill.

100 tons, Encinal terminal Oakland, dam No. 1, Los Angeles to Concrete Engineering Co., Los Angeles.

100 tons, additional, factory, 1611 Georgia street, Los Angeles, to unnamed interest.

Contracts Pending

743 tons, jail, San Francisco; general contract to MacDonald & Kahn, San Francisco.

203 tons, San Gabriel dam No. 2, Los Angeles; Pacific Coast Steel Corp., San Francisco, low.

130 tons, waterworks, Conneaut, O.; bids May 20.

Spang Chalfant & Co. Inc., Pittsburgh, and subsidiary company, reports for the first quarter of 1933 a net loss of $292,152. No comparison is available for the same three months of 1932.

Pipe

Market Stronger—Increase in Cast Prices Expected—Pittsburgh Mills on Better Schedules

PIPE PRICES, PAGE 43

Pittsburgh—Demand for standard pipe shows a slight improvement, drill pipe, casing, and line pipe orders are infrequent. On certain small sizes of standard, galvanized and black pipe, mills have better operating schedules. Wheeling Steel Corp., Wheeling, W. Va., resumed operations at its Benwood, W. Va., tube mill division May 15, and Sharon Tube Co., Sharon, Pa., after three weeks idleness, resumed with a schedule May 16.

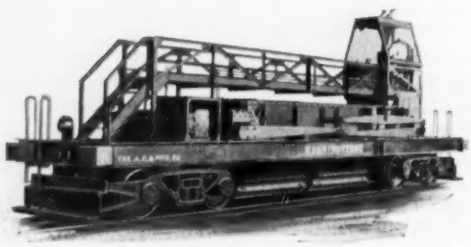
Chicago—Cast iron pipe producers plan to advance prices $3 a ton shortly, reflecting the recent upturn in pig iron quotations. Little business is provided to test prices although orders have increased moderately, and inquiries recently have been more numerous. Outstanding among new inquiries are two for Chicago requiring 1300 tons of various sizes.

Boston—Cast pipe prices are firmer, an advance of $1 a ton having been announced last week by the local foundry. Several large municipal inquiries depend on financing. A moderate tonnage of steel pipe is required for an oil storage extension at Chelsea, Mass.

New York — Eastern cast pipe foundries are attempting to get $35, foundry, an advance of about $4 over prices of several weeks ago, but this new quotation has not been tested. Inquiry and buying is light.

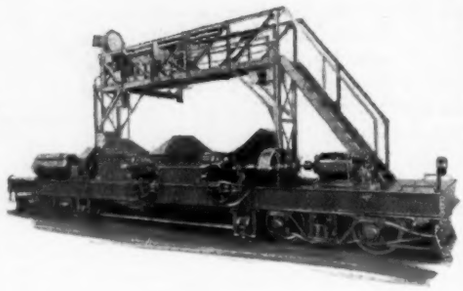
Birmingham, Ala.—Cast pipe production continues at low level. Manufacturers in this district are making effort to bring about government guarantees of credit on export business.

ATLAS SCALE CARS



20 Ton — Double Compartment Scale Car. Journals provided with self aligning anti-friction bearings. Equipped with Atlas Indicator and Recorder.

20 Ton Two Compartment Scale Car with Orr Bin Gate Operating Mechanism. Anti-friction bearings. Equipped with Atlas Indicating and Recording Mechanism.



Other Atlas Products

Gas-Electric and Diesel-Electric Locomotives—Car Pushers—Storage Battery Locomotives—Electrically Operated Industrial Cars—Scale Cars and Weighing Cars of all kinds — Ore Transfer Cars and Blast Furnace Charging Cars.

Coke Oven Equipment

Pushers and Levelers—Coal Charging Cars—Door Handling Machines — Coke Quenching Cars.

Also Atlas Patented Indicating and Recording Mechanism for Weighing Scales.

THE ATLAS CAR & MFG. CO.

Engineers *Manufacturers*

CLEVELAND, OHIO

Cast Pipe Pending

1300 tons, various sizes, Chicago; bids May 25.

Unstated tonnage, 10,000 feet of 4 and 6-inch for Berlin, Wis.; bids soon.

Oil Industry Inquiring For Alloy Steels

Alloy Prices, Page 43

Cleveland—Considerable inquiry for alloy steels has developed from the oil industry, for new refineries, and modernizing of others. This is the most active feature of the market, aside from demands from automobile builders. Ford, Chevrolet and Chrysler specifications have improved recently; mills sharing in these having increased operations.

Ferroalloys Firm

Ferroalloy Prices, Page 44

While indications point to higher prices on ferromanganese for second half, nothing definite has yet developed. Meanwhile, the market is firm at $68, eastern seaboard, on shipments to July 1. Specifications still are expanding. Domestic spiegeleisen, 19 to 21 per cent, is $24, furnace, for spot shipment.

Steel Nears Profit Stage As Operations Reach 40%

(*Concluded from Page* 15)

up from four to five on Thursday. Eight units continued active at Lorain, O. The Corrigan, McKinney company will have a third blast furnace in operation this week.

Youngstown

With 38 out of 83 open-hearth furnaces active, the steel rate last week was 45 per cent, with a gain of a point or two probable this week. Blowing in of an Ohio works blast furnace stack within 10 days will make 10 stacks active here.

Worcester

Three of the largest of the seven open-hearth furnaces are in operation at the American Steel & Wire Co. South Works here, giving this district an operating rate slightly over 50 per cent. Further improvement is expected shortly. Rods for the San Francisco-Oakland Bay bridge, recently awarded to the Columbia Steel Co., also a United States Steel Corp. subsidiary, will be manufactured here.

Birmingham

At 30 per cent, the ingot rate for this district is up 10 points. The Tennessee Coal, Iron & Railroad Co. rail mill may be started shortly.

Wheeling

Steelworks operations have advanced 5 points to 70 per cent. The Wheeling Steel Corp. mill at Benwood, idle all this year, has resumed.

Eastern Pennsylvania

Steelmaking operations last week gained 1½ points to 18 per cent. Indicative of a further increase in steelmaking are the reduction of stocks of billets and higher finishing operations. Bethlehem Steel Co. has lighted three open-hearth furnaces at Steelton and is resuming on its 28 and 44-inch mills there.

Buffalo

District steelworks were scheduled to maintain their 38 per cent operating rate for the third consecutive

Stronger Prices Developing In Semifinished Market

Semifinished Prices, Page 44

Report that a $2 advance in sheet bars, billets and slabs is contemplated for the third quarter is gaining more ground, but producers have not made a definite announcement. Forging billets are moving better at the usual $31 market, with requirements for wire rods improved at $35.

PROGRESS? YES!

When we told you why Mansfield Electrical Sheets are INHERENTLY GOOD, and they are, we did not mean that we feel satisfied with them. When they are perfect, we won't need to do much but rest, but now we are hustling constantly to make PROGRESS.

PROGRESS means to us doing a better job, giving you better sheets, better looking and better behaving, so that your job may be easier and that your motors and transformers may be better.

"Satisfaction is the worst enemy of progress and is one of the world's worst diseases."

C. F. Kettering

MANSFIELD ELECTRICAL SHEETS

EMPIRE STEEL CORPORATION

Mansfield, Ohio

Sales Offices:

New York, Dayton, Cleveland, Indianapolis, Chicago, Detroit, St. Louis, San Francisco

Pig Iron

Prices Continue Advance in All Districts; Differentials on Silicon Restored to 50c

PIG IRON PRICES, PAGE 44

Pittsburgh—Inquiries are now being firmly quoted $1 over a week ago, with prices $16 for malleable and foundry, $16.50 for bessemer and $15.50 for basic, all Pittsburgh district furnace. This is the second advance within a few weeks. Rumors of this latest advance drove in higher merchant iron specifications about a week to ten days ago. Shenango Furnace Co.'s Sharpsville, Pa., stack blew in last week, making two merchant furnaces operating in this and nearby valley districts. A. M. Byers Co. has closed on a round tonnage of bessemer iron for requirements over the next several months. It was a blanket order which, if entirely specified, may amount to as much as 10,000 tons.

Cleveland—Advance of 50 cents to $1 a ton in northern Ohio prices last week resulted in a considerable increase in bookings at figures previously quoted by furnace interests. For producers with headquarters in Cleveland the aggregate was close to 12,000 tons. Cleveland furnaces raised prices 50 cents to $15.50, base, furnace, for local delivery; and $1, up from $14.50, for shipment outside, thus establishing local and outside price on the same basis. Other furnaces in adjacent territory also raised prices 50 cents to $1. Higher scrap prices have created greater demand for pig iron. In 1929 the difference between foundry iron and scrap was approximately $3.28; in 1932, $7.49; today, $5.75. The 1929 difference between basic iron and heavy melting steel scrap was 25 cents; in 1932, $5; and today it is $3. Buying for second and third quarter has been fairly general, with railroads lagging. A Muncie, Ind., melter that inquired for 1000 to 3000 tons of malleable has closed for a substantial tonnage. New inquiry here totals 10,000 tons, including one lot of 2500 tons. Corrigan, McKinney Steel Co. will have a third blast furnace in operation this week.

Chicago—Shipments this month are expected to exceed those for the corresponding period of the preceding year for the first time since 1929, in addition to showing a substantial increase over April. The recent price advance has had only a moderate effect on new business. Silicon differentials, 25 cents since last year, are to be restored to the 50-cent level shortly.

Boston—Some third quarter buying is being done, with the New England furnace covering one melter for 500 tons. Small-lot purchasing has gained. Prices are steady.

New York—While volume of new orders has shown little change, sellers are encouraged over an improvement in the melt. Jobbing foundries are more active. The eastern Pennsylvania base on No. 2 plain is now $15.50, furnace.

Buffalo foundry iron prices here have been advanced about 50 cents. The increase is based on higher allowances for water transportation. Silicon differentials also have been raised from 25 cents to 50 cents. Buffalo iron now is being quoted on a new basis in central and western New York, the territories being divided into three zones, with that around Buffalo taking the present $16 base; the territory next to it taking a $15.50 price, and the third, farthest East, $15. The principal point farthest East under this arrangement is Utica.

Philadelphia — Another advance of $1 has been announced by eastern Pennsylvania producers, the third increase since April 1. No. 2 plain foundry is quoted at $15.50, base furnace, with malleable at $16 and basic at $15.25. While specifications continue to show only mild improvement, this latest advance stimulated contracts.

Buffalo—Demand has reached the peak of last year. Active buying finds sales limited by refusal of producers to close contracts for delivery beyond Oct. 1. It is reported another blast furnace probably will be blown in in this district shortly. American Radiator & Standard Sanitary Corp.'s stack also goes into production about June 1.

Cincinnati—Sales tapered following a rush to cover earlier in the week, before prices for both northern and southern iron were advanced. The former is now $17.01, base, delivered Cincinnati, an advance of 75 cents; the latter is quoted 50 cents less, $16.51, base, delivered Cincinnati.

St. Louis—Market continues active, with new orders and shipments holding up well, the former aggregating about 5000 tons, mainly for third quarter delivery. Both northern and southern furnace interests have announced price advance of 50 cents.

Birmingham, Ala. — Production has been increased by the blowing in one of the city blast furnaces of the Sloss-Sheffield Steel & Iron Co. making four now in operation, three on foundry and one on basic. Base price, $12, No. 2 foundry, is firm. No competition is felt from scrap.

Toronto, Ont.—Sales for the week dropped to about 300 tons. Producers expect to start shipping over water routes soon.

CENTRAL • •
Quality Products

For 80 Years

critical buyers of iron and steel quality products have placed their confidence in Central

CENTRAL IRON & STEEL CO.
HARRISBURG, PA.

Mirrors of Motordom

(*Concluded from Page* 16)

low dealer requirements as a matter of conservatism, and retail deliveries still are lengthening.

In addition to assembling Pontiac cars at the Chevrolet branch at Tarrytown, N. Y., the program now also includes St. Louis, Oakland, Calif., and Atlanta, Ga. Including the plant at Pontiac, Mich., and Tarrytown, five distributing points are now set up. Each plant would specialize in the models and color combinations most popular in the territories served.

Olds and Buick, the former now on a 5-day week, each will turn out slightly more than 5000 units this month, with Buick expediting its releases for June and indicating a duplication of May production. This is the peak of the year for Buick, its market being more seasonal than any other General Motors line. The Cadillac-LaSalle May total will be about 500 units, but its sales will be larger as dealer inventories are being whittled down.

Ford Developing Small Four

Ford, after touching 2300 units daily recently, is now holding at about 2000, 5 days a week, and indications are that substantially this rate will carry over into June. The low-price eight apparently has been shelved for the time being, but development work continues on the light four which is expected eventually to be the Ford bid for volume farm business when the West and South pay up their debts and are again actively in the market.

There is nothing, however, to indicate the immediate introduction of such a model and Mr. Ford is reported as believing that over the immediate future the market for trucks will be relatively more attractive than that for passenger cars.

Mr. Ford, who personally is dictating the copy for a series of advertisements which will appear weekly for an indefinite period, is not specifically plugging for either the passenger car or the truck at this time. Incidentally, in July Mr. Ford will be 70, at which age he would be compelled to retire if he were associated with the United States Steel Corp.

The wave of reports that the Ford steelworks will be sold has subsided, but another crop of rumors has Mr. Ford operating the plant shortly. These rumors may be predicated on a start upon repair work to several of the open-hearth furnaces. As forecast, Mr. Ford has sold his Universal Credit Corp. to the Commercial Investment Trust Corp., receiving $30,000,000 for his interest.

But while the Ford steelworks continues to produce more rumors than steel, the Great Lakes Steel Corp. division of the National Steel Corp. is quietly laying the groundwork for a large expansion program. Additional open-hearth furnaces will be constructed and a strip mill to roll rim stock added. This is in addition to the relining of one of the National blast furnace stacks of Zug island and the construction of a new slag plant there.

Plymouth continues behind in retail deliveries despite expansion of assemblies to a rate of almost 30,000 for May. The competition for delivery of special models is as keen as in the lush days of 1929. In the week ended May 6 retail sales broke all resords at 4700 units. Plymouth, however, is offering longer trades than some of its competitors.

PERKINS
MAN COOLER

(Trade Mark Reg. U. S. Pat. Off.)

Perkins Man Cooler provides refreshing re-circulation of air at the same temperature in which the men are working, with the natural result of larger production and consequently lower costs.

The new Perkins Oscillating Man Cooler gives a degree of oscillation from 30 to 120 degrees as desired.

B. F. Perkins & Son, Inc.

Engineers and Manufacturers Holyoke, Mass.

Scrap

Readjustments Bring Quiet, But Further Buying Is Near—Prices Generally Strong

Pittsburgh—The market quieted considerably last week, with no buying. No. 1 heavy melting steel is quoted $11.50 to $12 and were it not for the rather definite assurance that several mills will enter the market this week, further weakening would be noted. On the contrary, it is felt new buying would develop a price of around $12 in this district. Heavy melting steel scrap from the Pennsylvania railroad has been moving into a plant in this district on the basis of a recent exchange which the Pennsylvania engineered with some leading rail producers. An interesting test appears certain to develop early this week when with most brokers covered or long on the market, buying, or lack of it, will decide.

The mill at Brackenridge, Pa., has

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	7.00 to 8.00
Boston, dealers	5.00 to 5.50
Buffalo, No. 1	10.00 to 11.00
Buffalo, No. 2	8.50 to 9.00
Chicago	8.50 to 9.00
Cleve., No. 1	9.00 to 9.50
Cleve., No. 2	8.50 to 9.00
Det., No. 1 deal.	7.50 to 8.00
Det., No. 2 deal.	7.00 to 7.50
E. Pa . del. mill	9.00 to 9.50
E. Pa., No. 2 del.	7.00 to 7.50
Federal, Ill.	7.75 to 8.25
Granite City, Ill.	7.50 to 8.00
N. Y., deal, R. R.	6.00 to 6.25
N. Y. deal. No. 2	4.50
N. Y. deal. yd.	2.50 to 3.00
Pitts., No. 1	11.50 to 12.00
Pitts. No. 1 R. R.	12.00 to 12.50
St. L. No. 1 sel.	7.50 to 8.00
Valleys, No. 1	12.00 to 12.50

COMPRESSED SHEETS

Buffalo, dealers	8.50 to 9.00
Chi. (Factory)	7.00 to 7.50
Cleveland	9.00 to 9.50
Detroit, dealers	7.50 to 8.00
E. Pa. new mat.	8.00 to 8.50
Pittsburgh	11.00 to 11.50
Valleys	11.50 to 12.00

BUNDLED SHEETS

Buffalo	4.75 to 5.25
Cincinnati, del	4.75 to 5.25
Cleveland	6.50 to 7.00
Eastern Pa.	6.50 to 7.50
Pittsburgh	10.00 to 10.50
St. Louis	4.00 to 4.50

SHEET CLIPPINGS LOOSE

Chicago	3.50 to 4.00
Cincinnati	3.00 to 3.50
Detroit, dealers	3.00 to 3.50
St. Louis	4.00 to 4.50

STEEL RAILS SHORT

Birmingham	8.50 to 9.00
Boston, dealers	4.75 to 5.25
Buffalo	11.00 to 11.50
Chicago (3 ft.)	10.00 to 10.50
Chicago (2 ft.)	10.50 to 11.00
Cincinnati, del.	10.00 to 10.50
Detroit, deal.	10.50 to 11.00
Pitts. (open-hearth, 3 ft. and less)	12.00 to 12.50
St. Louis	10.00 to 10.50

STOVE PLATE

Birmingham	6.00 to 6.50
Boston, dealers	2.00 to 2.50
Buffalo	8.00 to 8.50
Chicago, net	7.00 to 7.50
Cinci., deal. net	4.25 to 4.75
Det., net deal.	3.50 to 4.00
Eastern Pa.	7.00 to 7.50
N. Y., deal. mill	3.50 to 4.00
St. Louis	6.00 to 6.50

COUPLERS, SPRINGS

Buffalo	10.50 to 11.00
Chicago	9.50 to 10.00
Eastern Pa.	10.00 to 10.50
Pittsburgh	13.00 to 13.50
St. Louis	8.00 to 8.50

ANGLE BARS—STEEL

Chicago	9.00 to 9.50
St. Louis	7.50 to 8.00

LOW PHOSPHORUS

Buffalo, billets and bloom crops	10.00 to 11.00
Cleveland bil. and bloom crops	12.00 to 13.00
Eastern Pa.	10.50 to 11.00
Pittsburgh billet bloom crops	13.75 to 14.25
Pitts., sheet bar crops	13.75 to 14.25

FROGS, SWITCHES

Chicago	8.50 to 9.00
St. Louis	7.50 to 8.00

SHOVELING STEEL

Chicago	8.50 to 9.00
Cleveland	5.75 to 6.00
St. Louis	7.50 to 8.00

RAILROAD WROUGHT

Birmingham	6.50 to 7.50
Boston, dealers	2.00 to 2.50
Buffalo, No. 1	6.50 to 7.00
Buffalo, No. 2	10.00 to 11.00
Chi., No. 1, net	7.00 to 7.50
Chi., No. 2	8.50 to 9.00
Cinci., No. 2	7.50 to 8.00
Eastern Pa.	10.00 to 10.50
N. Y., No. 1, deal.	4.00 to 5.00
Pitts., No. 1	11.50 to 12.00
St. Louis, No. 1	5.25 to 5.75
St. Louis, No. 2	7.75 to 8.25

SPECIFICATION PIPE

Boston	3.00 to 4.00
Eastern Pa.	7.50 to 8.50
N. Y., deal.	3.25 to 3.75

BUSHELING

Buffalo, No. 1	8.00 to 9.00
Chicago, No. 1	7.00 to 7.50
Cinci., No. 1 deal.	5.00 to 5.50
Cinci., No. 2	2.75 to 3.00
Cleve., No. 2	6.00 to 6.50
Det., No. 1 new deal.	6.00 to 6.50
St. Louis, No. 1	4.50 to 5.00
Val. new No. 1	11.00 to 11.50

MACHINE TURNINGS

Birmingham	2.50 to 3.00
Boston, dealers	2.25 to 2.50
Buffalo	4.25 to 4.50
Chicago	4.00 to 4.50
Cinci., deal.	4.00 to 4.50
Cleveland	5.50 to 6.00
Detroit	4.50 to 5.00
Eastern Pa.	5.00 to 5.50
N. Y., deal.	2.00 to 2.50
Pittsburgh	8.25 to 8.75
St. Louis	2.50 to 3.00
Valleys	8.75 to 9.25

BORINGS AND TURNINGS
For Blast Furnace Use

Boston, dealers	0.75 to 0.90
Buffalo	4.50 to 4.75
Cinci., deal.	4.00 to 4.50
Cleveland	6.25 to 6.75
Detroit, deal.	5.50 to 6.00
Eastern Pa.	3.50 to 3.75
N. Y., deal.	2.00 to 2.50
Pittsburgh	7.25 to 7.75

CAST IRON BORINGS

Birming., chem.	8.50 to 9.50
Birming., plain	2.50 to 3.50
Boston, chem.	5.50 to 6.00
Boston, dealers	1.00 to 1.25
Buffalo	4.50 to 4.75
Chicago	4.50 to 5.00
Cinci., deal.	4.00 to 4.50
Cleveland	6.25 to 6.75
Detroit, deal.	5.50 to 6.00
Eastern Pa.	3.50 to 3.75
E. Pa., chem.	10.00 to 12.00
N. Y., deal.	2.50 to 3.00
Pittsburgh	7.25 to 7.75
St. Louis	3.00 to 3.50

PIPE AND FLUES

Cinci., deal.	4.00 to 4.50

RAILROAD GRATE BARS

Buffalo	5.00 to 5.50
Chicago, net	6.00 to 6.50
Cincinnati	4.50 to 5.00
Eastern Pa.	7.00 to 7.50
N. Y., deal.	4.00 to 4.50
St. Louis	5.00 to 5.50

FORGE FLASHINGS

Boston, dealers	3.50 to 3.75
Buffalo	6.50 to 7.00
Cleve. ov. 10 in.	8.25 to 8.50
Detroit	5.00 to 5.50

FORGE SCRAP

Boston, dealers	1.75 to 2.00
Chicago	9.50 to 10.00
Eastern Pa., del.	7.00 to 7.50

ARCH BARS, TRANSOMS

Chicago, net	7.00 to 7.50
St. Louis	6.00 to 6.50

AXLE TURNINGS

Boston, deal.	2.50 to 3.00
Buffalo	6.00 to 6.50
Chi., elec. fce.	6.50 to 7.00
Cleveland	5.50 to 6.00
Eastern Pa., del.	7.50 to 8.50
St. Louis	4.00 to 4.50

STEEL CAR AXLES

Birmingham	9.00 to 10.00
Boston, ship. pt.	7.50 to 8.00
Buffalo	10.00 to 11.00
Chicago, net	10.50 to 11.00
Eastern Pa.	14.50
St. Louis	8.75 to 9.25

SHAFTING

Boston, ship. pt.	7.50 to 8.00
Eastern Pa.	12.00 to 13.00
N. Y., deal.	7.50 to 8.00
St. Louis	7.50 to 8.00

CAR WHEELS

Birming., iron	7.00 to 7.50
Boston, iron deal.	4.25 to 4.50
Buffalo, iron	8.00 to 9.00
Buffalo, steel	10.50 to 11.00
Chicago, iron	9.50 to 10.00
Chi., rolled steel	9.50 to 10.00
Cincinnati iron	6.75 to 7.25
E. Pa. iron	9.50 to 10.00
E. Pa. steel	10.00 to 10.50
Pitts., iron	11.00 to 11.50
Pitts., steel	13.00 to 13.50
St. Louis, iron	6.00 to 6.50
St. Louis, steel	7.50 to 8.00

NO. 1 CAST SCRAP

Birmingham	8.00 to 8.50
Boston, No. 2	3.00 to 3.25
Boston, textile	6.00 to 6.25
Buffalo, cupola	9.50 to 10.00
Buffalo (mach.)	10.00 to 10.50
Chicago, agri., net	7.00 to 7.50
Chi., mach. net	8.50 to 9.00
Chi., railroad net	8.00 to 8.50
Cinci., mach. cup.	7.50 to 8.00
Cleve. cupola	8.50 to 9.50
Det., net deal.	8.50 to 9.00
E. Pa. cupola	10.00 to 10.50
N. Y., cup. deal.	6.00 to 6.50
N. Y., del. local foundries	9.00 to 9.50
Pitts., cupola	10.50 to 11.00
San Fran., del.	13.50 to 14.00
Seattle	4.50 to 6.50
St. L. No. 1	6.00 to 6.50
St. L. No. 1 mach.	6.50 to 7.00

HEAVY CAST

Boston, del.	4.25 to 4.50
Bost., mach. cast	7.00 to 7.50
Buffalo, break	7.00 to 7.50
Cleve., break	6.50 to 7.00
Detroit, auto net deal.	9.00 to 9.50
Det. break., deal.	6.50 to 7.00
Eastern Pa.	9.50 to 10.00
N. Y. No. 1, deal.	5.50 to 6.00
N. Y. break, deal.	5.50 to 5.75
Pittsburgh	9.00 to 9.50

MALLEABLE

Boston, consum.	9.00 to 9.50
Buffalo	10.50 to 11.50
Chicago, agri.	7.50 to 8.00
Chicago, R. R.	9.75 to 10.25
Cinci., agri. del.	8.00 to 8.50
Cinci., R. R. del.	8.50 to 9.00
Cleveland, rail	10.00 to 10.50
Det. auto deal.	6.00 to 6.50
St. Louis	7.00 to 7.50

RAILS FOR ROLLING
5 feet and over

Birmingham	7.50 to 8.00
Boston, deal.	5.00 to 5.50
Buffalo	8.50 to 9.50
Chicago	10.00 to 10.50
Eastern Pa.	9.50
New York dealer	5.50 to 6.00
St. Louis	8.75 to 9.25

LOCOMOTIVE TIRES

Chicago, cut	8.50 to 9.00
St. L., No. 1	6.00 to 6.50

LOW PHOS. PUNCHINGS

Buffalo	10.00 to 11.00
Chicago	10.00 to 10.50
Eastern Pa.	10.00
Pittsburgh	13.00 to 13.50

bought a considerable tonnage of No. 1 heavy melting steel at $12 and compressed sheets at about the same price.

Cleveland—Scrap consumers continue to urge shipments, although in some cases they are laying down surplus supplies. One local mill has brought 2500 tons of No. 1 railroad heavy steel via lake vessel from Chicago but Cuyahoga river impediments interfered with economical unloading here. Slowing of buying has eased quotations on several grades of heavy material by 50 cents a ton, while turnings have advanced 50 cents.

Chicago—Iron and steel scrap prices continue strong, as evidenced by recent railroad sales. Mills, however, have been out of the market and lack of interest on the part of consumers has a weakening effect. Available scrap still is limited to small lots except at premium prices, despite the sharp advance in quotations over recent weeks. Heavy melting steel nominally is unchanged at $8.50 to $9, the last sale to a consumer having been made at $8.75, while more than $9 was paid for railroad material.

Boston—Better than $7, Worcester, Mass., has been paid for No. 1 heavy melting steel, the market for active grades holding firmly. It develops that the New York, New Haven & Hartford recently sold close to 25,000 tons of scrap to three eastern steelworks. Some buying against export orders continues, with negotiations for further shipments pending. New domestic buying is light.

New York—Stove plate has advanced to $5, barge. Other grades are firmly held at recent advances. No. 1 and No. 2 steel scrap is moving to the Pittsburgh district, dealers paying $5.65 for the former and $4.15 for No. 2, f.o.b. Buying for export continues at unchanged prices. Domestic demand is heavier.

Philadelphia—While heavy melting steel and some cast grades are unchanged, several scrap items have been advanced here recently. Some of these changes were largely nominal and represented a realignment with other grades that had been previously advanced. Buying generally over the past week has been confined to small lots.

Cincinnati — Quotations on iron and steel scrap have been revised upward despite lessened buying, as dealers became assured a new level of prices was set by recent purchases. Some quiet buying was done at prices which show the market strong.

Detroit—Some iron and steel scrap prices have been lowered 50 cents a ton, including melting steel, borings and turnings, due not to any basic weakness but to the fact that dealers' prices recently were anticipating higher levels than materialized. Most dealers regard the present situation as a leveling-off rather than as an inherent weakness or a definite reaction. The reappearance of demand would immediately push prices up again. Youngstown district demands appear satisfied for the time being, but Cleveland still is buying. Considering the expansion in automobile production, the increase in scrap offerings is light. Chrysler has sold its accumulation of 30,000 tons of bundles and short turnings. Foundry grades are strong, being up 50 cents to $1.50, as foundries are buying ahead and encountering a scarcity of cast grades.

Buffalo—Additional tonnage of No. 1 and No. 2 heavy melting steel is reported to have been purchased by the largest local melter, the form-

Electro Coated
STRIP STEEL
Zinc • Copper • Tin
● The Thomas method of electroplating nonferrous metals on steel strip provides a material of wide utility in the manufacture of countless products. Individual requirements for rust-resistance, the base for further plating, and appearance are combined with the workability, the gauge and temper uniformity, and the fast, continuous production advantages of strip steel.
● Thomas non-ferrous metal coatings will not crack or peel under deep drawing and severe forming. Coatings are uniform, non-porous and of fine appearance.
● A Thomas representative will gladly assist you in determining the adaptability of Thomastrip to your product. Send for test samples—specify coat, gauge, width and temper desired.
The THOMAS STEEL CO.
WARREN OHIO
ELECTRO COATED
ThomaStrip
COLD ROLLED STRIP STEEL
SPECIALIZED PRODUCTION COLD ROLLED STRIP STEEL

er at $10 and the latter at $8.50. Efforts to purchase large tonnage have failed completely, dealers claim. Several small lot sales of other materials have established new 1933 high prices.

St. Louis—Iron and steel scrap holds the general strength of recent weeks, with several grades up an additional step. Purchasing of heavy tonnage has not been reported, but there have been numerous sales of small lots which make a comfortable aggregate. Inquiry is out for a considerable tonnage of heavy melting steel and steel specialties, and there is more interest in malleable and cast grades.

Birmingham, Ala.—Scrap is in plentiful supply and prices are firm with indications of advances on buying.

Toronto, Ont.—Domestic demand for scrap is almost at a standstill, but dealers report improvement in sales of steel scrap for export. Local dealers have made a general downward revision in buying prices and are now quoting $4.50 per gross ton for wrought iron and steel axles, boiler plate, heavy melting steel and rails; hydraulic compressed sheets have been reduced to $3.50 gross ton, while cast borings and wrought pipe have been marked up 50 cents to $2.50 per gross ton. No. 1 machinery cast is now being purchased at $7 net; standard car wheels, $6.50; malleable, $6 and stove plate $4 per net ton. Corresponding reductions are also shown in Montreal prices.

Equipment

Sales Fail To Hold Pace of Other Lines; Demand Spotty

Pittsburgh—Inquiries for new installations of steel mill equipment have declined somewhat the past week, especially in roll orders. Builders, however, maintain a sizeable backlog of actively pending mill rehabilitation and new building work. A feature of the market has been the upswing in demand for ingot molds, prompted by improved open-hearth schedules. One mold interest here reports April was its best month of any since 1929 and May is equally as good. Another mold manufacturer has been obliged within the past week to blow in a blast furnace to obtain bessemer iron for its ingot mold shop. One equipment builder here estimated last week that 75 per cent of present mill equipment is obsolete. Two leading makers of rolling mill equipment here will announce new types of rolling mills some time within the next few weeks.

New York—Navy awards include: Electric melting furnace, Pittsburgh Lectromelt Furnace Corp.; two radial drills, Lloyd & Arms; rotary shear, Kemp Machinery Co.,; horizontal turboblower, American Blower Corp.; superheaters, Foster-Wheeler Corp. Bids closed this week on 18 machine tools for the Frankford, Pa., arsenal, including four automatic screw machines, automatic chuck, planetary milling machine, steam hammer, two presses and special tools. Baldwin-Southwark Corp. has been awarded a 50-ton testing machine for Frankford. W. E. Shipley Machine Co. is low on a universal turret lathe for the Philadelphia naval aircraft factory.

Worcester, Mass.—While operating rates have improved, demand for machinery and new equipment is light; although repair and parts business has increased, notably in the textile field. Activity among western Massachusetts plants has gained materially in some instances with exceptions of large orders about to be closed by an oil burner fabricator.

Cleveland—Sales are spotty, with repair parts and replacement work continuing in the limelight. Sentiment is much improved and little if any seasonal letdown in the next few months is anticipated. A company building meters here has been booking fair orders from southern textile mills, some of which are building their own power plants to supply electric current requirements.

Chicago—Machinery and equipment markets gradually are developing better activity though sales still are light. Inquiries continue to expand slowly and orders recently have been more numerous. Continued absence of purchases by railroads still is a restricting factor in sales. While machine tool purchases for public institutions have been light for many months, there is some hope that initial orders for tools for the new Lane Technical high school here may be placed before the end of the year. This project ultimately will require more than 150 machine tools.

M. A. Hanna Co., Cleveland, reports net profit of $162,495 in the first quarter of 1933, after interest, depreciation, depletion and other charges, compared with profit of $132,289 in the same period of 1932.

STRIP STEEL
HOT and COLD ROLLED

in regular carbon Steel of any analysis including alloy steels

also
RUST RESISTING METALS
in
CHROME and CHROME NICKEL
analyses

SUPERIOR STEEL CORPORATION

General Office
3122 Grant Building
Pittsburgh, Pa.

Works at
Carnegie, Penna.

SALES OFFICES

1904 Fidelity-Philadelphia Trust Bldg.
Philadelphia, Pa.

2100 Fisher Bldg.
Detroit, Mich.

Steel Sales Corp.
129 South Jefferson St.
Chicago, Ill.

H. L. Brown,
2001 Carew Tower
Cincinnati, Ohio

Pacific Coast

Current Buying Light with Several Projects Nearing Bidding Stage—Pipe Activity Below Normal—Most Prices Are Firm —New Bids Asked on Diablo Power Project

San Francisco—(*By Air Mail*)—While general movement of steel products has improved, few awards of size have been booked. A number of new inquiries are about ready to come up for figures. Among these is 1500 tons of sheet steel piling for the San Francisco-Oakland bridge. Prices appear firm with exception of plates.

Reinforcing bar bookings included 260 tons for San Gabriel dam No. 1, Los Angeles, taken by the Concrete Engineering Co. Soule Steel Co. took 100 tons for the Encinal terminal in Oakland, Calif., and unnamed interests booked 100 tons additional for a factory in Los Angeles. Out-of-stock quotations hold around 2.00c, base, on carload lots. Mild steel bars are firm at 2.10c, c.i.f.

Only two structural awards are noted. Unnamed interests took about 400 tons of sheet piling for contract No. 2, West bay substructure, San Francisco-Oakland bridge. Consolidated Steel Corp. booked 250 tons for trestles at Boulder City, Nev., for the Six Companies. MacDonald & Kahn were awarded the general contract for 1500 tons for the new jail in San Francisco. New inquiries include 800 tons for a bridge at San Bernardino, Calif., 500 tons for a bridge on Ramona boulevard, Los Angeles, and 100 tons for a postoffice at San Gabriel, Calif. Plain shapes are firm at 2.10c, c.i.f., with wide flange material quoted at 2.20c.

Seattle Market Quiet

Seattle—While business sentiment is better, improvement develops slowly in iron and steel. A better export outlook, an upturn in intercoastal shipping, larger lumber orders and higher commodity prices are favorable factors.

Prices are firm, mill quotations on all sheets being 2.00c over April levels. Nails continue weak. The jobbing trade has not revised quotations but will make readjustments should mills announce further advances.

New bids have been asked for Seattle's Diablo project powerhouse, tail race and transmission line, opening May 24. City officials are working out a new plan for financing the local seawall improvement and bids are expected to be invited early in June.

Cast iron pipe inquiry is small. Snohomish, Wash., is in the market for 5000 feet of 10-inch and Ephrata, Wash., has opened bids for about 40 tons of 4-inch steel dipped pipe. Aberdeen, Wash., has purchased a small tonnage of secondhand pipe.

Not much turnover is reported in export scrap, present shipments being purchases of a month ago. Japanese buyers evidently are waiting until exchange adjusts itself but are always in the market for bargains.

Steel in Europe

British Activity Gains; Continental Comptoirs Ready

London—(*By Cable*)—While total output of pig iron in Great Britain in April, 324,700 tons, was below the 332,200 tons of March, the average daily rate of April was 10,823 tons, compared with 10,716 tons in March, due to the shorter month. Active stacks numbered 69 at the end of April, compared with 70 in March. Steel production declined slightly in April, with 513,300 tons, compared with 577,700 tons in March. Imports and exports were both lower in April than in March. April imports of steel and iron were 70,891 tons, in March 96,963 tons; April exports were 132,847 tons, compared with 154,971 tons in March.

Gradual improvement continues in Great Britain, even the Birmingham district increasing activity. Export inquiry is expanding, especially from Canada and the Argentine, but prices are unremunerative. The Egyptian government has placed a large dam contract. Galvanized sheets face strong competition from the Continent.

Reports from the Continent are that organization of the several steel comptoirs is being perfected, to cover five years, starting June 1. Prices are hardening in anticipation of the effects of this development and steel producers feel the situation will be much better under the comptoirs.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, May 18

Export Prices f.o.b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665	
PIG IRON	£ s d		£ s d	£ s d
Foundry, 2.50-3.00 Silicon	$11.44	2 18 6	$8.27	1 14 0
Basic bessemer	10.56	2 14 0*	6.81	1 8 0
Hematite, Phos. .03-.05	11.53	2 19 0	.....	.....
SEMIFINISHED STEEL				
Billets	$19.55	5 0 0	$10.95 to $11.19	2 5 0 to 2 6 0
Wire rods, No. 5 gage	29.33	7 10 0	$21.90	4 10 0
FINISHED STEEL				
Standard rails	$30.30	7 15 0	$26.77	5 10 0
Merchant bars	1.14c	6 10 0	.63c	2 17 6
Structural shapes	1.29c	7 7 6	.55c to .56c	2 10 0 to 2 11 0
Plates, †¼ in. or 5 mm.	1.44c	8 5 0	.85c	3 17 6
Sheets, black, 24 gage or 0.5 mm.	1.49c	8 10 0	1.29c	5 17 6
Sheets, gal., 24 gage, corr.	1.84c	10 10 0	1.51c	6 17 6
Bands and strips	1.36c	7 15 0	.74c	3 12 6
Plain wire, base	1.53c	8 15 0	1.18c	5 7 6
Galvanized wire, base	1.84c	10 10 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	2.10c	12 0 0	1.27c	5 15 0
Tin plate, box 108 lbs.	$ 3.13	0 16 0	.....	.....

British ferromanganese $68 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks	
Fdy. pig iron, Si. 2.5	$12.22	3 2 6*	$ 9.08	200	$ 9.34	290	$18.77	69
Basic bessemer pig iron	11.53	2 19 0*	9.08	200	7.08	220	20.54	75.50
Furnace coke	2.59	0 13 3	5.45	120	3.54	110	5.24	14.25
Billets	19.55	5 0 0	17.48	385	12.72	395	26.25	96.50
Standard rails	1.44c	8 5 0	1.46c	697	1.73c	1,150	1.62c	132
Merchant bars	1.18c	6 15 0	1.11c	530	.75c	500	1.35c	110
Structural shapes	1.53c	8 15 0	1.16c	550	.75c	500	1.32c	107.50
Plates, †¼-in. or 5 mm.	1.51c	8 12 6	1.43c	680	.98c	650	1.56c	127
Sheets, black	1.66c	9 10 0§	1.79c	850‡	1.05c	700‡	1.77c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	2.06c	11 15 0	2.94c	1,400	2.10c	1,400	4.55c	370
Plain wire	1.53c	8 15 0	2.37c	1,130	1.95c	1,300	2.18c	177
Bands and strips	1.66c	9 10 0	1.05c	500	1.01c	675	1.56c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. (a) dd. Middlebrough.

Nonferrous Mill Products

Base price cents per pound f.o.b. mill except otherwise specified. Copper and brass product prices based on 6.75c, Conn., for copper

Sheets

Yellow brass (high)	12.37½
Copper, hot rolled	14.62½
Lead sheets, cut, to jobbers	7.25
Zinc sheets (100-lb. base)	9.00

Tubes and Pipes

Seamless yellow brass (high)	14.00
Seamless copper	14.12½

Rods

Yellow brass (high, full turning)	9.87½
Naval brass	11.00

Anodes

Copper untrimmed	12.00

Wire

Yellow brass (high)	12.37½

Old Metals

Dealers' buying prices, cents lb

No. 1 Composition Red Brass

New York	3.50 to 3.62½
Chicago	3.25 to 3.75
Cleveland	4.50 to 5.00
St. Louis	3.25 to 3.50

Heavy Yellow Brass

New York	2.75 to 3.00

Heavy Copper and Wire

New York	4.87½ to 5.12½
Chicago, No. 1	4.50 to 4.75
Cleveland	4.50 to 5.00
St. Louis	3.75 to 4.00

Composition Brass Borings

New York	3.00 to 3.25

Yellow Brass Tubing

Cleveland	3.25 to 3.50

Light Copper

New York	3.75 to 4.00
Chicago	3.25 to 3.75
Cleveland	4.00 to 4.50
St. Louis	3.25 to 3.50

Light Brass

Chicago	1.75 to 2.00
Cleveland	2.25 to 2.75
St. Louis	2.25 to 2.50

Lead

New York	2.50 to 2.75
Cleveland	2.25 to 2.75
Chicago	2.25 to 2.50
St. Louis	2.50 to 2.75

Zinc

New York	1.50 to 1.62½
Cleveland	1.50 to 1.75
Chicago	1.75 to 1.87½
St. Louis	1.50 to 1.75

Aluminum

Clippings, new, soft, Cleve.	12.00 to 12.50
Clippings, hard, Cleveland	7.50 to 8.50
Borings, Cleveland	4.00 to 4.50
Mixed cast, Cleveland	6.00 to 6.50
Mixed cast, St. Louis	6.25 to 6.75

Secondary Metals

Brass ingot, 85-5-5-5	6.75
Remelt aluminum No. 12	10.00 to 11.00

Metals

Prices Hold Steady Although Demand Is Slower—Increased Galvanizing Operations Seen

New York—Demand for nonferrous metals was less active last week but most prices held steady. The international economic and political outlook brightened further and added evidence of revival in the metal markets was discernible.

Copper—The week opened with the appearance of fair demand for copper and with sellers more reluctant to take business at the 7-cent level established for electrolytic metal near the close of the preceding period. As the week progressed, however, the buying movement became less pronounced but the metal was available at no less than 7.00c. The market maintained a firm appearance and apparently only lacked the development of moderate demand to push prices still higher. The metal now is quoted 40 per cent above the low of a few weeks ago. Fabricators have been experiencing increased demand and have been good buyers of copper. Copper and brass product prices were advanced ⅛-cent to 1 cent per pound further and brass ingot one-fourth to ½-cent. Scrap also went higher.

Lead—Sales were in small volume but the market continued strong. Current orders have been for spot and June delivery but a little metal also is reported to have been booked into July. A substantial portion of consumer needs for June have been placed.

Zinc—Most sellers quoted prime western zinc at 3.75c, East St. Louis, during the week but business also was done at 3.70c and 3.72½c for prompt and June delivery. Some sellers maintained that they would not take business at under 3.80c but none was reported done. Increased galvanizing operations are looked for in the trade.

Antimony—The market continued quiet with quotations unchanged.

Tin—Profit-taking in London resulted in a break in the tin market in this country early in the week but much of this loss was recovered later. Fair tonnages were booked. Spot Straits brought a premium, due to scarcity.

Aluminum—Remelt grades gathered more strength and were more active. Virgin was quiet.

Silver—Little further tendency to advance was shown and the metal was quoted 33.12½c an ounce late in the week, against a recent high of 37.25c.

Coke By-Products

Per Gallon Producers' Plants, Tank Lots

	Spot
Pure benzol	$0.22
90 per cent benzol	0.22
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26

Per Pound at Producers' Plants in 250-Pound Drums

Phenol	0.153 to 0.173

Per Pound at Producers' Plants

Naphthalene flakes	4.75 to 5.75
Naphthalene balls	4.75 to 5.75

Per 100 Pounds Atlantic Seaboard

Sulphate of ammonia	$1.15

Quicksilver Quiet

New York—Quicksilver prices are unchanged, small lots being quoted $57, a virgin flask of 76 pounds. Round lots are held at $56 to $56.50 a flask. The market is reported quiet.

Wrought Standards Ready

The revised simplified practice recommendation R57-32 covering wrought iron and wrought steel pipe valves and fittings is available at 5 cents a copy from the superintendent of documents, government printing office, Washington.

Nonferrous Metal Prices of the Week, Cents a Pound

Spot unless otherwise specified

	Copper			Straits Tin		Lead	Lead	Zinc	Aluminum	Antimony	Ingot
	Electro., del. Conn.	Lake, del. Midwest	Casting, refinery	New York Spot	New York Futures	N. Y.	East St. L.	St. L.	98-99%	Spot, N. Y.	Nickel
May 13	7.00	7.12½	6.75	36.62½	36.75	3.65	3.52½	3.70	*22.90	6.25	35.00
May 15	7.00	7.12½	6.75	35.62½	35.75	3.65	3.52½	3.75	*22.90	6.25	35.00
May 16	7.00	7.12½	6.75	35.75	35.87½	3.65	3.52½	3.70	*22.90	6.25	35.00
May 17	7.00	7.12½	6.75	36.25	36.37½	3.65	3.52½	3.70	*22.90	6.25	35.00
May 18	7.00	7.12½	6.75	36.70	36.70	3.65	3.52½	3.70	*22.90	6.25	35.00
May 19	7.00	7.12½	6.75	36.00	36.00	3.65	3.52½	3.70	*22.90	6.25	35.00

*Nominal quotation. Market range 19.90c to 22.90c.

Here and There in Industry

MIDLAND TUBE & PIPE CO., 32 Broadway, New York, has purchased a steel plant at Bound Brook, N. J., originally erected by American Ball Engine Co. and later occupied for about a year by the Badenhausen Corp., Philadelphia, boiler manufacturer, as plant No. 4. The Midland company plans to install new equipment and employ 150 to 200 workers. The company's present plant at Bordentown, N. J., was badly damaged by storm last fall and will be abandoned as soon as the Bound Brook property can be put into operation. The new plant is located on a 4-acre site and provides greater floor area than the company's Bordentown plant.

□ □ □

Newman-Crosby Steel Corp., New York, has moved its sales office to 1701-11 Woolworth building.

□ □ □

Morgan Engineering Co., New York, has moved its offices to 11 West Forty-second street, New York, room 2482.

□ □ □

Independent Bridge Co., Neville Island, Pittsburgh, is completing fabrication of gates for the Montgomery dam on the Ohio river, said to be the largest on that river.

□ □ □

Victor Safe & Equipment Co., Marietta, O., has bought the plant of the North Tonawanda Musical Instrument Co., North Tonawanda, N. Y., and will move its plant and offices there at once.

□ □ □

Dykes Bros., Memphis, Tenn., manufacturers of steel window sash and door frames, have leased the George P. Hooper warehouse, 16,000 square feet of floor space, to accommodate increasing business.

□ □ □

Hinderliter Tool Co., Tulsa, Okla., has established a warehouse and office at 3624 McKinney avenue, Houston, Tex., to serve new oil fields in that region. George E. Justice is in charge.

□ □ □

Climax Molybdenum Co., H. L. Brown general manager, Continental Oil building, Denver, is planning to increase production at Climax, Colo., from 1000 tons a day to 3000, and to double its force of 250 men.

□ □ □

Vickers-Armstrong, Newcastle-on-Tyne, Eng., has acquired British manufacturing rights from the E. W. Bliss Co., New York, for Bliss presses and other mechanical devices, including can-making machinery.

□ □ □

Oil Equipment and Engineering exposition at Houston, Tex., May 22-28, will feature steel products in the form of newest oilfield drilling and pumping equipment, pipeline and refinery materials in which new alloys and stainless steels have a large part.

□ □ □

Wagner Electric Co., St. Louis, finds a decided increase in demand for motors and hydraulic brakes since April. Increased refrigerator demand has brought orders for electrical equipment, following resumption of beer selling.

□ □ □

Schneidau & Devlin,, 1028 Maritime building, New Orleans, representing various manufacturers in that district, has added to its line the Annis dry type air filter for ventilating and industrial purposes. The filters are manufactured by Coppus Engineering Corp., Worcester, Mass.

□ □ □

Benjamin Wolff & Co., Kedzie avenue and Twenty-eighth street, Chicago, sellers of tin plate and steel, have opened offices and warehouse under the name of Benjamin Wolff & Co. Inc., 19 Clara place, Glendale, Long Island, N. Y., in charge of Charles R. Voden. Complete stock of bright coke tin plate will be carried.

□ □ □

General Motors Corp., Detroit, has bought the Sunlight Electric Co., Warren, O., manufacturer of fractional horsepower motors for refrigerators, washing machines and other household appliances. It will be operated as a subsidiary of the Delco Products Co., Dayton, O., a General Motors subsidiary.

□ □ □

Flexible Steel Lacing Co., Chicago, H. J. Beach president, manufacturer of steel belt lacing, finds business satisfactory for the first four months of 1933. Foreign buying has been much larger than a year ago. Prospects are that both domestic and foreign demand will be increased materially in the near future.

□ □ □

Shallcross Control Systems Co., 3707 North Richards street, Milwaukee, is making a shipment of open-hearth furnace control equipment to the Broken Hill Proprietary Co., Newcastle, New South Wales, Australia. Four years ago this company furnished controls for a new coke plant built by Broken Hill interests.

□ □ □

Charles Taylor Sons Co., Cincinnati, has appointed Walter S. Aylsworth, 411 Boulevard of the Allies, Pittsburgh, representative in that district in the sale of its refractory and fireclay bricks. C. W. Poe Co., Cleveland, manufacturer of mineral wool insulating materials, has also named Mr. Aylsworth its representative in the Pittsburgh territory.

□ □ □

Beals, McCarthy & Rogers Inc., Buffalo, has been appointed sole distributor in the Buffalo district and western New York for Vanadium-Alloys Steel Co., Pittsburgh. This appointment is in addition to representation of Colonial Steel Co., Pittsburgh, whose products have been sold for the past 35 years by the Beals company.

□ □ □

Terminal Sales Co., Texas & Pacific terminal warehouse, Fort Worth, Tex., has been formed to act as broker and manufacturers' agent in Texas, with a representative in each county representing a limited number of noncompetitive lines. The company is headed by E. G. Dugey, J. P. S. Morgan and A. L. Scudder.

□ □ □

Blaisdell-Folz Equipment Co., Cincinnati, a new contractors' equipment firm, has been appointed by the Chain Belt Co., Milwaukee, its representative in the Cincinnati district for its complete line of construction equipment. The new company has purchased the equipment division of the Queen City Supply Co., including stocks and accounts and has started operations at 219 West Pearl street.

□ □ □

Maurath Inc., Cleveland, manufacturer of special purpose electrodes, is moving to larger quarters at 7309 Union avenue, to obtain better facilities for production of electrodes for users of stainless and heat-resisting alloys. This concern has found business expanding despite the depressed condition of most lines and has not reduced wages. Export demand is also excellent.

□ □ □

Bucyrus-Erie Co., South Milwaukee, Wis., has bought inventory and manufacturing rights to all drilling machinery heretofore made by the Armstrong Mfg. Co., Waterloo, Iowa. The purchase includes all movable physical assets but not the plant. George R. Watson, formerly president and chief engineer of the Armstrong company, becomes associated with the Bucyrus-Erie company in charge of the drilling machinery division.

□ □ □

Monsanto Chemical Works, St. Louis, has received an order for plans and specifications and for its catalyst, for a sulphuric acid plant to be built by Mitsui & Co. Ltd. in Japan, to be one of the largest in the world. Production will be under Monsanto license and will use vanadium mass catalyst. Plants under license from the Monsanto company are in operation in Mexico, Peru, Persia, Chile, Borneo, United States and European countries and one is under construction in China.

Wide Range of Topics for Steel Institute Speakers

(*Concluded from Page* 19)

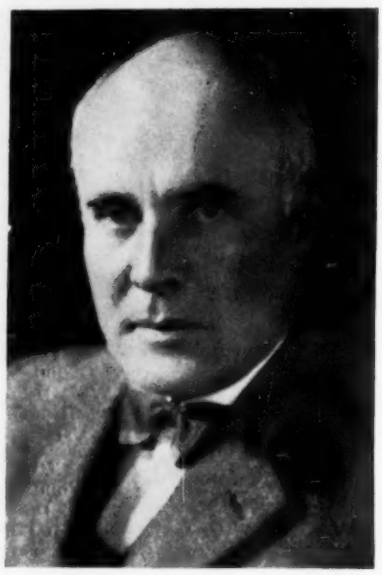
club, New York; a director of the League of Political Education, and of the Advertising Federation of America.

♦ ♦ ♦

DR. ANSON HAYES, who will present a paper on "The Aging of Mild Steel Sheets," is director of research, American Rolling Mill Co., Middletown, O., in which capacity he has served the company since Aug. 1, 1929. Previously he was chief chemist of its research department. Dr. Hayes was graduated from Drake university with the class of 1908. His master's degree was obtained at Iowa State college; and his Ph. D. degree, at the University of Chicago. Dr. Hayes then returned to Iowa State college, where he held the chair of physical chemistry for 12 years. At that time he taught graduate courses in thermodynamics and directed research on the stability of iron carbide. This work was of much importance in the manufacture of malleable iron from so-called white iron.

♦ ♦ ♦

DR. JOHN JOHNSTON, who will discuss Dr. Anson Hayes' paper on "The Aging of Mild Steel Sheets," has been director of research, United States Steel Corp., since 1927. For nine years prior he was Sterling professor of chemistry, Yale university, and chairman of the department of chemistry. Born Oct. 31, 1881, in Perth, Scotland, he was educated at Perth academy and at University college, Dundee. In 1903 he was admitted as an associate of the Institute of Chemistry of Great Britain. Awarded a Carnegie scholarship in chemistry in 1903, he conducted researches two years in Dundee. In 1907-8 he was research associate in the laboratory of physical chemistry, Massachusetts Institute of Technology, Boston. Dr. Johnston spent eight years, 1908-16, on the staff of the geophysical laboratory of Carnegie Institution of Washington. For a year he was in charge of American Zinc, Lead & Smelting Co.'s research department,



Francis H. Sisson

St. Louis. In 1918 he was associated with the government's investigation of war gas, and later served as secretary of National Research council, Washington.

E. F. ENTWISLE, superintendent, Saucon division, Bethlehem plant, Bethlehem Steel Co., Bethlehem, Pa., whose subject is "Insulation of Open-Hearth Furnaces," was graduated from Cornell university in 1906, with a degree of mechanical engineer. For a year he was associated with Ford, Bacon & Davis, in Nashville, Tenn., as assistant engineer. From late in 1907 to early in 1914 he was employed in the mechanical department, Duquesne, Pa., plant, Carnegie Steel Co., except one year in the steam engineering department. In 1914 he became master mechanic of the Sparrows Point, Md., plant of the Maryland Steel Co. Upon the acquisition of the Pennsylvania Steel Co. by Bethlehem he was transferred to Bethlehem's Steelton, Pa., plant as mechanical engineer. In 1917 he was transferred to Bethlehem's Donaghmore plant, Lebanon, Pa., as superintendent, and in 1918 went to the Steelton plant as assistant general manager. He assumed his present duties in 1928. His father, E. B. Entwisle, retired, was chief engineer of the Lorain Steel Co., Lorain, O., many years.

♦ ♦ ♦

HOWARD G. MARSH, who will present a paper on "The Use of Rolled Steel in Machine Production," has been associated 25 years with the Carnegie Steel Co., Pittsburgh. Mr. Marsh was born in Pittsburgh in 1885 and after grade and preparatory school education attended the University of Pittsburgh from which he was graduated with the degree of mechanical engineer. His first business connection was with the American Cotton Picker Co., Pittsburgh, in 1906. Two years later he entered the employ of the Carnegie company at the McCutcheon mills. During 1917 and 1918 he was stationed at the company's alloy forging division, and in 1919 was identified with its bar and hoop division at the general offices in Pittsburgh. A year later he became a specialty salesman in the slack barrel and hoop department. Recently he has been active in the development of new uses and new markets for steel for the Carnegie company.

♦ ♦ ♦

EVERETT CHAPMAN, who will discuss H. G. Marsh's paper on "The Use of Rolled Steel in Machine Construction," is first vice president, in charge of engineering, Lukenweld Inc., Coatesville, Pa. Mr. Chapman was graduated from the University of Michigan in 1923 and received a master's degree one year later. He then taught electrical engineering at Purdue university, and from 1925 to 1930 was associated with the research laboratory of the Lincoln Electric Co., Cleveland. Since 1930 he has been affiliated with Lukenweld Inc.

Mr. Marsh's paper also will be discussed by Lloyd Jones, manager, E. W. Bliss Co., Salem, O.

Frank Samuel, *President* — **S. A. Cochran**, *Vice Pres.* — **Snowden Samuel**, *Sec'y. Treas.*

FRANK SAMUEL & CO., Inc.

Harrison Bldg., Philadelphia, Pa.

Alloys	Pig Iron	Muck Bars
Ferro Manganese	Low Phos	Low Phos and Special
Ferro Chrome	English	The American
Ferro Silicon	French	Swedo Iron Co.'s
Calcium Silicide		
Silico Manganese		

Manganese Ore	Iron Ores	Chrome Ore
Open Hearth Use		Lump
Blast Furnace Use		Ground

Branch Offices:

New York, 39 Cortlandt St. — Boston, Mass., 24 Alban Road — Pittsburgh, Tenth St. & Duquesne Way

Construction and Enterprise

New York

BATH, N. Y.—Village trustees are considering plans for a municipal waterworks. E. H. Woodbury, Bath, N. Y., is chairman of the committee gathering data.

BOLIVAR, N. Y.—Contract has been awarded to Leader Industries Inc., Decatur, Ill., for erection of an oil refinery at Bolivar, to cost about $755,000. Construction is to be started at once.

NEW YORK—Benson Gear Corp. has been incorporated with $20,000 capital, by Frank A. Finnerty, 52 Vanderbilt avenue, New York.

NEW YORK—Kings Metal Products Corp. has been incorporated with $5000 capital to manufacture metal products, by Estelle Abramson, 2 Lafayette street, New York.

NEW YORK—Stutz Machine Corp. has been incorporated with $10,000 capital to manufacture vending machines, by Miles J. Goldberg, 26 Court street, Brooklyn, N. Y.

NEW YORK—Mayer Mfg. Corp. has been incorporated with $10,000 capital to manufacture machinery, by Jean Katcher, 1475 Broadway, New York.

NEW YORK—Roto-Rack Inc. has been incorporated with $2250 capital to manufacture metal and wooden display fixtures, by Baer, Bennett & Fulton, 29 Broadway, New York.

NEW YORK — Liska Machine Works Inc. has been incorporated with $20,000 capital to manufacture machinery, by Charles R. Liska, Congers, N. Y.

NEW YORK—Buhs-Pence Products Inc. has been incorporated with 200 shares no par value to manufacture equipment for breweries, by Homer L. Pence, 65 West Thirty-ninth street, New York.

TROY, N. Y.—F. P. Case & Sons, Troy, have taken a contract from J. P. Ward Foundry Co. for a foundry plant addition 40 x 290 feet at Blossburg, Pa.

Ohio

NEWARK, O.—Buckeye Rolling Mill Co. has been incorporated with $50,000 capital, by Gordon D. Kinder and associates.

Michigan

BAY CITY, MICH.—Yale Electric Products Co. has been incorporated with 1500 shares no par value to manufacture electric and oil furnaces, by E. L. Smith, Bay City, Mich.

DETROIT—Stanley Steel Co., 434 East Milwaukee street, has been incorporated with $10,000 capital to deal in steel and iron.

DETROIT — Neal-Sommers Corp., 1002 Hammond building, has been incorporated with $2000 capital to manufacture automatic machinery, by Frank X. Sommers, 12791 Hampshire avenue, Detroit.

GRAND RAPIDS, MICH.—McInerny Spring & Wire Co. has been incorporated with $200,000 capital to manufacture springs and wire construction, by James L. McInerny, 55 Cottage Grove street, S. W., Detroit.

MT. PLEASANT, MICH.—City commission has authorized a survey relative to erection and operation of a municipal lighting plant and has retained Ayres, Lewis, Norris & May, engineers, Ann Arbor, Mich., to make it.

Indiana

LAFAYETTE, IND.—Peerless Wire Goods Co. has begun full-time operations at its plant here, with two 11-hour shifts and a full complement of men.

Illinois

CHICAGO—Graham Plating Works Inc., 831 South Kostner avenue, has been incorporated with $10,000 capital to do plating work, by Martin Delevitt, 10 North Clark street, Chicago.

CHICAGO—Grodkin Lock Corp., 122 South Michigan avenue, has been incorporated with $25,000 capital to manufacture automotive accessories, by Lilienthal, Scheyer & Miles, 127 North Dearborn street, correspondents.

CHICAGO—American Steel Box Corp., 105 North Clark street, has been incorporated with $5000 preferred and $5000 common stock to manufacture steel products, by Harry A. Fleck, 105 North Clark street, and associates.

PEORIA, ILL.—Plant of the Metal Barrel Corp., foot of Pecan street, has been damaged $10,000 by fire.

Southern States

ANNISTON, ALA.—Emory Pipe & Foundry Co. has recalled 150 men to work after several weeks of idleness. The plant was burned early this year and has been rebuilt.

WASHINGTON—Bureau of supplies and accounts, navy department, will take bids as follows: May 31, schedule 141, one motor-driven forced draft blower for delivery at Philadelphia; May 23, schedule 143, one motor-driven oxygen type, cutting machine for delivery at Boston.

Wisconsin

MILWAUKEE — Crown Vending Equipment Co., 2207 Kirkwood avenue, Cudahy, Wis., has leased larger manufacturing space at 2039 South Bennett street, Milwaukee, where 15,000 square feet is available. Eight types of machines will be put into production.

MILWAUKEE — Allis-Chalmers Mfg. Co., West Allis, Wis., has been awarded a contract at about $1,100,000 for construction and installation of four turbines at Boulder dam on the Colorado river.

RHINELANDER, WIS. — Connor Lumber Co., Rhinelander, plans erection of a sawmill in Gogebic county, Michigan, where it has timber holdings to last 15 years.

SHEBOYGAN, WIS.—County board of commissioners has accepted the bid of Stewart Iron Works Co., Cincinnati, for jail equipment for the new $600,000 courthouse, at $17,155.

TWO RIVERS, WIS.—City council has authorized its public utilities committee to plan for a filtration plant as extension of the municipal waterworks, to cost $80,000 to $100,000.

WAUKESHA, WIS.— T. F. Durst, trustee for bondholders, has bid in the plant and other assets of I. B. Rowell Co., manufacturer of agricultural tools, at $73,603. A reorganization is being effected.

Minnesota

MINNEAPOLIS—Erickson Machine Works has been incorporated with 500 shares no par value to manufacture tools, machinery and equipment, by Frank Sedell, 2920 Forty-second avenue south, Minneapolis, and associates.

North Dakota

GRAND FORKS, N. DAK.—Dr. Irvin Lavine, chairman of the light rate committee of the city council, after a survey reports about $700,000 would be required to build and equip a municipal electric light and power plant and distribution system.

Pacific Coast

MEDFORD, OREG.—Southern Oregon Brewing Co., Ted Gebauer manager, plans erection of a brewery here with capacity of 100 barrels, to be in production by Sept. 1.

SEATTLE—Harry Rowe has had plans drawn for a foundry building and pattern shop at 5416 Shilshole avenue, two stories, 38 x 80 feet.

TACOMA, WASH.—Ace Furnace & Steel Works, 3700 South Union street, will build an addition 100 x 115 feet for which additional equipment will be purchased. Working force will be doubled. Structural steel for a number of projects is being furnished. A. T. Davis is manager.

Dominion of Canada

VANCOUVER, B. C.—Big Slide Mining & Developing Co. will install a 350-horsepower unit on its properties at Kelly creek and Fraser river, to cost $20,000. Plans are by S. O. Perret, engineer, 1875 Robson street, Seattle. R. M. Abernethy, 342 West Pender street is secretary.

PERIN ENGINEERING Co., Inc.
CONSULTING ENGINEERS

Investigations, Reports, Development of Raw Materials, Ore Sintering, Coke Ovens, Blast Furnaces, Open Hearth and Electric Steel Plants, Rolling Mills, Power Plants, Cement Plants

11 WEST 42nd ST. **NEW YORK**
Cable Address **PERINESTEP**

TUBE MILL MACHINERY
TAYLOR-WILSON MFG. CO
ENGINEERS — FOUNDERS — MACHINISTS
Main Office and Works: McKees Rocks, Pa.
(PITTSBURGH DISTRICT)

JAMES CRISWELL COMPANY
Furnace Engineers & Contractors
Open Hearth, Soaking Pits and heating furnaces
Keenan Bldg. Pittsburgh, Pa.

The BANTAM BALL BEARING CO.
32nd Year
SOUTH BEND INDIANA
JOURNAL—RADIAL—THRUST
Ball and Roller Bearings—½ to 48 inches in diameter. ONE OR A MILLION
New York Detroit Chicago Philadelphia Cleveland

For Low Cost Industrial Heating—
"We Guarantee Results"
F. & D. Producer Gas Systems
Using Bituminous and Anthracite Coals Raw and Scrubbed Gas for Displacing Oil, City and Natural Gas, Coal and Coke in Furnaces of all descriptions.
Flinn & Dreffein Co., 308 W. Washington St. Chicago, Ill.

HOLCROFT & COMPANY
LEADERS IN BUILDING AND DESIGNING ELECTRIC AND COMBUSTION FURNACES, KILNS AND OVENS.
HOME OFFICE: DETROIT—BRANCHES: CHICAGO, PHILADELPHIA
CANADA: WALKER METAL PRODUCTS, LTD., WALKERVILLE, ONT.
BUILT BY HOLCROFT & COMPANY DETROIT-MICH.

SIMONDS GEARS
& RAMSEY SILENT CHAIN DRIVES
ALL KINDS • • • ALL MATERIALS
The Simonds Manufacturing Co.
Pittsburgh, Pa.

SC&H Furnaces are made for annealing, case hardening, carburizing, forging, cyaniding, lead hardening & oil tempering.
STRONG CARLISLE & HAMMOND
1400 W. 3rd St., Cleveland, O.
SC&H Furnaces are built in all sizes of Oven, Pot, Continuous, and Special Types for Electric, Oil or Gas application.

Drop and Upset Forgings
From 6 oz. to 15 lbs.
Low overhead for us means low prices for you.
Twenty years' experience.
Fruin Drop Forge Company
341-355 West Root St. Chicago, Ill.

GALVANIZING
Plants at Columbus, Ohio and Torrance, California. Single dip in long lengths. Sherardizing equipment at Columbus.
INTERNATIONAL-STACEY CORP.
Columbus, Ohio Torrance, Cal.

CERTIFIED
MALLEABLE IRON CASTINGS
Detachable Sprocket Chain
Riveted Sprocket Chain
Malleable Washers, etc.
PEORIA MALLEABLE CASTINGS CO.
FT. ALEXANDER ST. PEORIA, ILLINOIS

Pickling of Iron and Steel
—By Wallace G. Imhoff
Price Postpaid $5.15 (25s.6d.)
This book covers many phases of pickling room practice and construction and maintenance of pickling equipment.
THE PENTON PUBLISHING CO.
Book Department
1213 W. 3rd St. Cleveland, O.
429-S

SMALL ELECTRIC STEEL CASTINGS
(Capacity 500 Tons per Month)
WEST STEEL CASTING CO.
CLEVELAND OHIO, U. S. A.
"He Profits Most Who Serves Best"
Better Steel Castings